MILITARY REVIEW

VOLUME XXVIII FEBRUARY 1949 NUMBER 11

Editor in Chief
COLONEL R. A. NADAL

North American Edition
Editor: LT. COL. M. N. SQUIRES; *Assistant Editor:* CAPT. K. SHERMAN

Spanish-American Edition
Editor: LT. COL. A. F. BRUNO; *Assistant Editors:* MAJ. J. A. ANDINO, MAJ. W. MARTORANI, LT. F. J. RAMOS, LT. L. A. MONSERRATE

Brazilian Edition
Editor: MAJ. H. A. HERRERA, *Brazilian Army,*
Assistant Editor: CAPT. E. C. SANCTOS, *Brazilian Air Force*

Administrative Officer
MAJ. D. L. NORDYKE

Production Manager
CAPT. R. B. WINNINGHAM

CONTENTS

ESTABLISHMENT OF THE WOMEN'S ARMY AUXILIARY CORPS	Lt. Col. M. E. Treadwell, *USAF* (Res)	3
THE CONCEPT OF AIRBORNE FORCES	Lt. Col. W. A. Kuhn, *Inf*	17
THE NEED FOR A PERMANENT TRANSPORTATION CORPS	Col. N. H. Vissering, *GSC*	25
AN INTRODUCTION TO MILITARY GEOGRAPHY—PART I	Col. H. M. Forde, *Cav*	30
REPACKAGING REQUIREMENTS OVERSEAS	Lt. Col. J. W. Schroder, *Ord*	37
DEFENSE ALONG THE ABUCAY LINE	Lt. Col. H. K. Johnson, *Inf*	43
MEDICAL RESEARCH AND DEVELOPMENT PROGRAM	Col. D. Longfellow, *MC*	53
MILITARY ETHICS	Maj. (Chaplain) A. C. Longley	56
MILITARY NOTES AROUND THE WORLD		63
FOREIGN MILITARY DIGESTS		73
Airborne Forces		73
Australian Army in World War II		78
An Allied Error?		80
Spain—A Factor in European Politics		82
Higher Command of the Armed Forces		85
Zhukovski Academy of Military Aviation Technique		92
Action and Counteraction in Battle		93
The Battle for Stalingrad		96
The Loss of Singapore—A Criticism		100
German Artillery Concentrations		104
Initiative in Taking Paris		107
Command and Supply		109

MILITARY REVIEW—Published monthly by the Command and General Staff College at Fort Leavenworth, Kansas. Entered as second-class matter August 31, 1934, at the Post Office at Fort Leavenworth, Kansas, under the Act of March 3, 1879. Subscription rates: $3.50 (U.S. currency) per year in the United States and other countries of the Western Hemisphere; $4.50 a year in all other countries. Reprints are authorized, provided credit is given the "MILITARY REVIEW," C&GSC, Fort Leavenworth, Kansas.

COMMAND AND GENERAL STAFF COLLEGE

COMMANDANT

LIEUTENANT GENERAL M. S. EDDY

ASSISTANT COMMANDANT

BRIGADIER GENERAL H. N. HARTNESS

STAFF

COLONEL E. D. POST, *General Staff Corps* ---------- Chief of Staff
COLONEL J. H. HILLS, *General Staff Corps* ---------- A. C. of S., G-1
COLONEL J. H. GILBRETH, *General Staff Corps* ---------- A. C. of S., G-2, G-3
COLONEL L. L. BINGHAM, *General Staff Corps* ---------- A. C. of S., G-4
MAJOR L. E. BARBER, *Adjutant General's Department* ---------- Adjutant General

FACULTY

COLONEL R. N. YOUNG, *Infantry* ---------- Director, Department of Commander and General Staff
COLONEL D. H. HUNDLEY, *Infantry* ---------- Director, Department of Personnel
COLONEL H. V. WHITE, *Infantry* ---------- Director, Department of Intelligence
COLONEL G. B. BARTH, *Field Artillery* ---------- Director, Department of Operations and Training
COLONEL F. A. HENNING, *Field Artillery* ---------- Director, Department of Logistics
COLONEL E. B. GJELSTEEN, *Field Artillery* ---------- Director, Department of Analysis and Research
COLONEL R. E. FISHER, *Air Force* ---------- Chief, Air Section
CAPTAIN B. W. WRIGHT, *United States Navy* ---------- Chief, Naval Section
COLONEL G. G. ELLIOTT, *British Army* ---------- Chief, British Section
COLONEL W. J. EPES, *Field Artillery* ---------- Director, Extension Course Department
COLONEL H. B. ENDERTON, *Field Artillery* ---------- Chief, Allied Officers Section
COLONEL H. D. KEHM, *Field Artillery* ---------- Chief, Instructor Training Section
COLONEL J. H. VAN VLIET, *Infantry* ---------- Secretary

Establishment of the Women's Army Auxiliary Corps

Lieutenant Colonel Mattie E. Treadwell, *USAF* (Reserve)
Historical Division, Department of the Army Special Staff

The Coming of War

ON 1 September 1939, under the shadow of imminent hostilities, General George C. Marshall was appointed Chief of Staff, and a month later planning for a women's corps was resumed. A staff study of the problem was prepared by G-1 Division, a document remarkable for the shallowness of its perception of the factors involved, in comparison with earlier G-1 studies. There is no evidence as to whether planners were aware of the Phipps and Hughes studies; * in any case, the new plan did not reflect its predecessors in any way, and used different sources on the British and AEF experiences.

The most important idea in the new plan, as it reflected current War Department thinking, was that women must under no circumstances be given full military status. Planners therefore set themselves to devise a workable plan which would give the Army full military control over a women's auxiliary, while giving the women none of the rights and benefits of soldiers.

The Civilian Conservation Corps was hit upon as the model. WAAC leaders were later to consider this analogy extremely unfortunate, since the CCC had been a peacetime organization employed in separate camps, whereas the WAAC was to be used in Army camps and overseas where a distinction in status became far more difficult. The plan likewise blithely proposed an idea which the British had long ago proved faulty: That while some women would be set up in "quasi-military female organizations" similar to companies, others would roam around individually or in small groups. It was stated that women's probable jobs would include those of "hostesses, librarians, canteen clerks, cooks and waitresses, chauffeurs, messengers, and strolling minstrels."

As for uniforms, it was stated that the females' "natural desire—a matter of pride"—should be met; likewise some titles of rank should be granted, but "it is perhaps preferable to devise titles different from those of the Army and Navy. . . . It appears that no real principle is involved and that feminine tastes may be allowed some play when the time comes to adopt titles and insignia of rank."

The plan was tucked away for a rainy day, and for another eighteen months

Many problems of high-level planning had to be considered before the WAAC was created in 1942 to "make available to the national defense the knowledge, skill and special training of the women of the nation."

* The author here refers to two early studies on the utilization of women in the military services. One study was by Miss Anita Phipps, Director of Women's Relations for the Army until 1931. The other was by Major (later Major General and Chief of Ordnance) E. S. Hughes, of the G-1 Division, in 1928.—The Editor.

the War Department refused to commit itself to sanction such a Corps.

By March of 1941, a change in tone had crept into official statements; in a letter to an inquirer General Marshall stated: "While the United States is not faced with an acute shortage of manpower such as has forced England to make such an extensive use of its women, it is realized that we must plan for every possible contingency, and certainly must provide some outlet for the patriotic desires of our women."

The motivating force for this change was not primarily the approach of war, still eight months away, but the mounting evidence from all sides that women's determination to assist in the war effort, if not channeled and directed by the military forces, either would result in a repetition of the chaos of the last war when competing private groups took the field, or would be seized upon by some central agency outside the control of the War Department.

The immediate motive for action was supplied by Congresswoman Rogers of Massachusetts, for many years an authority on legislation concerning women.

In the spring of 1941, Mrs. Rogers called upon the Chief of Staff and informed him that she intended to introduce a bill to establish a women's corps. General Marshall replied, "Give me a week to consider it," and afterwards asked that the week be extended to a month.

During this month the War Department plunged into furious planning for a bill which the Army could safely sponsor. The hasty plan which was concocted by the G-1 Division provided for a WAAF (Women's Army Auxiliary Force) modeled on the CCC, definitely a civilian auxiliary and not part of the Army. The proposed plan nevertheless made it explicit that, while WAAF units would be commanded by women officers, the chain of command above company level was the Army chain; the WAAF Director would have no command power over her women.

The plan's authors believed that it would avoid the errors of World War I. Cited advantages of the plan included not only greater skills and greater controls, but the fact that "it will satisfy pressure which must be expected to become severe for the creation of such organizations and will tend to avert the pressure to admit women to actual membership in the Army." Cited disadvantages included not only the many special arrangements necessary for women's care, but the fact that the Corps would "inject many other unpredictable problems into military administration."

Most of the General and Special Staff Divisions, when the plan was submitted to them for comment, agreed with G-1's reasoning. Although The Surgeon General concurred, the Director of the Army Nurse Corps did not favor the bill. Only The Judge Advocate General proposed full military status, fearing legal and disciplinary complications in an auxiliary.

The Secretary of War rejected the idea at first sight, declaring it "premature," but upon learning the alternatives, he acceded.

Representative Roger's Bill

Accordingly, on 28 May 1941, Mrs. Rogers introduced in the House of Representatives "A Bill to establish a Women's Army Auxiliary Corps for Service with the Army of the United States."

H. R. 4906, provided that the WAAC was to be a Corps of 25,000 women for noncombatant service; it was "not a part of the Army but it shall be the only women's organization authorized to serve with the Army, exclusive of the Army Nurse Corps." There followed a statement of its mission which was extremely significant, for it indicated that a decision had

been made which was perhaps the most basic and vital of the Corps' history: The WAAC was established "for the purpose of making available to the national defense the knowledge, skill, and special training of the women of the nation." The emphasis on a small number of skilled workers, instead of large numbers of unskilled, was deliberate, but later developments were to make it appear that no one yet fully understood the tremendous implications which this decision would have in necessitating procedures different from those for men. In fact, the same planners in a list of possible duties included such jobs as charwoman and laundry worker.

By a curious omission, the bill neglected to make a point which had been clear in earlier plans: That the WAAC was to operate under Army command channels. Instead, command responsibility was publicly placed on the Director, who was to "operate and administer the Corps in accordance with the normal military procedure of command." The Director was also to advise the War Department and "make recommendations as to plans and policies."

Endless legal distinctions were also attempted. Waacs were to receive medical service from the Army but to be on Civil Service status for burial or for hospitalization after discharge. Members were considered military personnel for benefits of the Soldiers and Sailors Relief Act but not for benefits of the Act granting reemployment rights, except for those who left Civil Service jobs. Most important, the extent to which they could be disciplined was not clear; it was stated that Waacs were to be subject to the Articles of War "when applicable," but it was to develop that no one in the War Department then or later ever knew when they were applicable.

This Bill, after its introduction, immediately sank from sight; it was not to become law for a full year. In accordance with the usual ritual, it was referred to the Bureau of the Budget and to the War Department for comment. The Bureau of the Budget did not reply for four months, and meanwhile G-1 Division had reversed its previous show of approval and now ventured the hope that the Chief of Staff would withdraw his support or at least not commit himself until the Bureau of the Budget was heard from.

Chief of Staff Support

Nevertheless, the Chief of Staff made it clear in the fall of 1941 that he had come to favor the Bill with more than official conviction. About this time he told several of his staff members that, while he did not see any immediate need for large numbers of women in the Army, he would like to have authorization for a women's corps "on his books" so that if the need for quick action should arise, the point of debate would be past.

The Chief of Staff therefore took personal action to needle the agencies still brooding on the WAAC Bill. Although the U.S. Civil Service Commission and the Employees Compensation Commission had both been persuaded by Mrs. Rogers to render favorable reports, the Bureau of the Budget informed the War Department on 7 October: "It is not believed that the enactment of the proposed legislation, at least at the present time, should be considered as being in accord with the program of the President." The Bureau of the Budget stated that "there appears to be no need for a WAAC inasmuch as there will never be a shortage of manpower in the limited service field."

In his attempts to get the measure past the Bureau of the Budget, the Chief of Staff employed a newcomer to the War Department, one of the War Department's civilian consultants, Mrs. Oveta

Culp Hobby. Mrs. Hobby had, in the summer of 1941, been "virtually drafted" to come to Washington to set up the new Women's Interest Section of the War Department Bureau of Public Relations, a section designed to furnish soldiers' wives and mothers with information which would reassure them about the living conditions of their drafted relatives. He therefore asked Mrs. Hobby to give the G-1 planners any assistance on the public relations aspect of the WAAC Bill which they might need. By this time Mrs. Hobby was thoroughly familiar with the legislation, and was appointed the only female War Department representative in negotiations with the Bureau of the Budget and in later Congressional hearings.

In efforts to get the WAAC Bill past the Bureau of the Budget, General Marshall made a personal call and sent a highly favorable written report to the effect that "this legislation has great merit." Already unknowingly overshadowed by the coming events at Pearl Harbor, the report on 25 November 1941 spoke of gaining "valuable time while time is available" in order to develop a small corps in an orderly and efficient fashion, capable of expansion later. On Thanksgiving Eve, General Marshall checked over with General Hilldring, G-1, the measures now completed to make the War Department ready for the gathering storm, and, noting that WAAC legislation was still among the missing, directed him to omit no step to insure its immediate passage. General Hilldring later related: "General Marshall shook his finger at me and said, 'I want a Women's Corps right away and I don't want any excuses! At that, I displayed considerable energy."

General Hilldring's energy was shortly reinforced by that of the Japanese at Pearl Harbor. On 11 December, four days after Pearl Harbor, a chastened Bureau of the Budget withdrew its objections. The way was now clear to ask Congress for the "orderly and efficient" development of a small women's corps capable of expansion in wartime.

When later criticism is leveled against the agencies and individuals who failed, in the five months now left before the passage of the Bill, to anticipate and prevent every problem of the new organization's development, it must be remembered that they were attempting in 150 days, and in the midst of events which dwarfed the WAAC in importance, to settle problems which twenty-three years of leisurely planning had not succeeded in solving. "Women's ignorance" and "man's intolerance" had now come together in the fatal combination of Major Hughes' prophecy, and it remained only to be seen whether the results would be as dire as predicted.

Active Pre-Planning

The Secretary of War sent his approval of the Bill to Congress on Christmas Eve. By the last day of 1941, Mrs. Rogers had incorporated the War Department's proposed amendments into the Bill and reintroduced it as H.R. 6293. The Navy Department occasioned some delay while it tried to persuade the War Department not to sponsor the Corps. Finally the Assistant Secretary of War in person succeeded in persuading the Navy to withdraw "their objections to our endorsing it." Navy personnel chiefs flatly refused to make the project a joint one, informing General Hilldring, "You are going to take a beating and we'll wait to see what happens."

Much of the work of steering the Bill was personally handled by Colonel Ira P. Swift of the War Department. The committees moved with what Mrs. Rogers felt was unprecedented speed: The House hearing on 20 January was followed by the Committee's approval on 28 January, by Senate hearings on 6 February and committee approval on 9 February. The

hearings ended in a blaze of gallantry on the part of the southern senators.

The Bill also stuck in the House Rules Committee for some days. It was General Hilldring's opinion that the only thing that saved the Bill from immediate and total defeat at this time was the personal support and prestige of the Chief of Staff. General Marshall stated to Congress that the proposal was "sound and practicable"; that such military control was necessary to the Army's efficiency; that when manpower problems arose it would be to industry's benefit for the Army to "absorb and utilize its proportionate share" of womanpower. The Secretary of War likewise threw his support behind the measure. Nevertheless, it became clear that passage was to be delayed for some days, while other more important war measures took precedence.

WAAC Pre-Planner

Meanwhile, War Department planning was racing frantically to keep ahead of the Bill's estimated rate of progress. Forty-five days were lost in December and January when the officer first charged with WAAC planning achieved little results. It was then decided to secure an officer with wide experience and acquaintance in the War Department, to establish and guide the new Corps; he was to have the title of Pre-Planner, WAAC, and was to operate from a somewhat floating position in G-1 Division to secure necessary action from all other agencies. Such an officer not being immediately available in the War Department, G-1 brought in from the field and temporarily assigned Lt. Col. Gilman C. Mudgett, U.S. Cavalry, and ordered him to "build a fire under WAAC planning."

Colonel Mudgett immediately launched a burst of pre-planning which at once involved the WAAC with every major Army command and War Department staff agency. The scope of his achievements was the more remarkable in view of the very little information that could be furnished him by the War Department. The problem at the time looked deceptively simple: The WAAC was to be a small organization, developed slowly. A Director would be appointed, and perhaps five Assistant Directors, and 100 officer candidates. The War Department proposed to get its first enrolled women from among volunteers already working at Aircraft Warning Service stations, merely placing them in uniform and paying them for their rations and quarters, so that they could continue to live at home—thus, incidentially, repeating the first mistake which British services had made, that of enlisting women without training and employing them without control of living quarters. On the other hand, this plan greatly simplified administration: It was merely necessary to furnish uniforms, which, because of the small numbers involved, could be tailor-made without much delay. After the AWS companies were filled, there would be ample time to consider the ten other companies which were to go to Corps Areas.

On his first day of operation the Pre-Planner, as directed by the War Department, took two steps which revealed two major ambiguities from which the WAAC was to suffer. The first step was to dismember WAAC planning among the various staff agencies of the War Department. This action was the only possible solution for getting quick action on planning, since one Pre-Planner could not have made detailed plans in the allotted time, but it was to prove unfortunate that the War Department did not at this time decide the future relationship of the Corps to these agencies. Each agency was instead merely informed of its current responsibility.

On the same day, the Pre-Planner wrote

letters to the Corps Areas and chiefs of branches informing them of the Bill's impending passage; Corps Areas were asked to plan for the use of one WAAC company each, and chiefs of branches were asked to comment on the possible use of Waacs at their Service Schools. As a result of a double misconception that Waacs would be recruited for unskilled menial duties and would not count against personnel allotments, not too much significance could be attached to the fact that Corps Areas at once requested not ten but twenty-four WAAC companies.

On the other hand, all of the chiefs of branches replied that they wanted none. The Chief of Engineers asked to be excused from taking a unit, and The Surgeon General refused to use Waacs in hospitals.

Nevertheless, in only a few days the Pre-Planner had shown almost meteoric progress. Uniform designs were being prepared by the Quartermaster and were expected at an early date. The Adjutant General was converting army forms and records for WAAC use; The Judge Advocate General was preparing tentative disciplinary regulations; the Signal Corps and the Air Corps were planning Aircraft Warning Service companies. Col. Mudgett suggested that a female Director and staff of three male officers be appointed at once; and action to secure these was begun by G-1. Within another ten days Col. Mudgett had obtained rough drafts of WAAC Regulations and enrollment forms, was working with G-4 on tentative barracks plans, had consulted the Office of The Surgeon General on enlistment physical examination, had planned recruiting with The Adjutant General, and had been promised the completed uniform by 1 May. In four more days he had secured plans for press releases on the appointment of the Director, had started The Judge Advocate on a certificate of appointment, and had secured G-3 approval of a training center Table of Organization. By 23 February, when the Director was added to the Pre-Planning group, many plans were too far advanced for much change without controversy with the planning agency.

By this date the WAAC Regulations were already written and approved by G-3 Division, although they could not be published until passage of the Bill was assured. G-3 had also approved the outline of instruction for the Officer Candidate School. Already prepared and sent to interested agencies for approval were most of the Corps' reports and records: The enrollment record, the report of physical examination, the service record, the certificate of appointment. Most of these were simply the records used for men, with the deletion of inappropriate wording. Budget estimates had already been forwarded to the War Department, and the Finance Department had virtually completed all fiscal rules. A Table of Organization had been drawn up for WAAC Headquarters, and similar Tables for WAAC companies and platoons. The Army Recruiting Service believed itself prepared to conduct recruiting. G-4 Division was convinced that WAAC housing "will present no great problem." Finally, a request had even been submitted for the assignment of an experienced Regular Army officer to act as school commandant.

The major omissions, at the end of Colonel Mudgett's month of independent planning, were those definitive actions and decisions which would set the still-theoretical plans rolling. No location had been found for a training center: A survey of hotels, colleges, and camps showed only that the tremendous Army expansion had left no room anywhere for Waacs, and it was suggested than an abandoned CCC camp be used. No uniforms or other clothing had been procured or even designed: The Quartermaster General merely had concluded that uniforms should be of

two shades of blue. No action had been taken to set up actual recruiting machinery; it was suggested that the Director make a transcontinental tour and personally select the first 100 officer candidates. The future WAAC Headquarters had not been organized; a major and two lieutenants had been ordered in for immediate assistance, and Colonel Mudgett suggested that the Director set up a headquarters like a general staff, with a male Executive and five female Assistant Directors.

All the Pre-Planner's work, complete or incomplete, suffered from being based on the War Department's faulty assumption as to the WAAC's future size, which the War Department was to discard later in the summer when manpower problems began to appear. It was actually supposed that the Corps would, during its entire first year, train only 10,600 auxiliaries and 340 officers—a miscalculation of some 600 per cent.

WAAC Director

The selection of a WAAC Director was a difficult matter. The G-1 Division demanded that all candidates for the position be healthy, of an active temperament, between the ages of 30 and 50, with executive experience involving the successful management of both men and women assistants, and most important, they must have had no previous affiliation with any pressure group. Mrs. Hobby was asked to recommend women who met these requirements, and she submitted a list of nine which included some of the nation's most successful career women: An advertising executive, a business manager, a bank president, several educators. Social and political leaders were not included. Congresswoman Edith Nourse Rogers was also asked to recommend candidates; she submitted only one name: Mrs. Hobby's. G-1 Division likewise submitted its own list of candidates to the Chief of Staff, and this included three names, headed by Mrs. Hobby's. Colonel Mudgett likewise approved of the choice, commenting later, "I have never known a finer executive, man or woman."

For a number of reasons the War Department's final choice fell upon Mrs. Hobby. She had the advantage over all other recommended candidates of being already familiar with WAAC plans and with War Department organization. An even greater asset, from the Army viewpoint, was that Mrs. Hobby was not, and had never been, a member of any pressure group, and it was deemed essential that the Director owe allegiance only to the War Department. The Chief of Staff informed the Secretary of War that Mrs. Hobby was his choice.

Meanwhile, a number of prominent political figures, including members of Congress, had acquired their own candidates, and G-1 Division urged speed in the appointment of a Director, since "efforts will be made by certain pressure groups to influence the Secretary of War in his appointment of the Director."

At the end of February, the Chief of Staff took upon himself the responsibility of moving Mrs. Hobby from the Bureau of Public Relations to join the WAAC Pre-Planners, although in view of her lack of official status all planning done by her was liable to reversal later if another candidate was selected by the Secretary of War.

Mrs. Hobby now found herself in a strange status; she was the unannounced head of a nonexistent office which could not become "WAAC Headquarters" until passage of legislation at an uncertain future date, but which meanwhile must perfect very complete plans requiring the formal coordination of many War Department agencies. Her "staff" was one Cavalry lieutenant colonel and one

civilian woman assistant. This little group began meeting in a corner of the Miscellaneous Branch of G-1 Division, but later in March acquired several rooms and a telephone in the rickety wooden Temporary "M" Building. On 27 February, a few days after Mrs. Hobby's arrival, there arrived the man who had been intended to be WAAC Pre-Planner: Major (later Colonel) Harold P. Tasker. With Major Tasker came two young Reserve lieutenants, just called to active duty, who had never had Army experience of any kind. For almost a month these six constituted the headquarters.

About the middle of March the office acquired its senior member, Colonel William Pearson, who was selected by The Adjutant General to be WAAC Adjutant General. Colonel Pearson was the only member of the staff who had ever previously served in Washington, but his service was not recent; he had been retired in 1936 after more than thirty-four years in the Regular Army, and had just been recalled to active duty. Shortly, four more officers arrived to complete the military staff.

Mrs. Hobby also secured the services of two women advisors: Mrs. Helen Woods (later Lt. Col. Woods), for administrative and legislative matters, and Mrs. Genevieve Forbes Herrick, for public relations.

The Director's Headquarters now numbered thirteen persons, which was eventually reduced to eleven by the departures of two lieutenant colonels who proved inadaptable. Seven of the eleven were Army officers, who now divided the headquarters' duties. Colonel Mudgett remained as Pre-Planner until just before the opening of the first WAAC School. Colonel Pearson handled administration and personnel; Major Macy was public relations advisor and Executive; Major Tasker was Liaison Officer with the War Department and also G-3 for the group; and the three lieutenants planned recruiting, clothing, supply, finance, regulations, and Tables of Organization. The women advisors assisted in planning, and Mrs. Hobby was assumed to have the final authority.

Under SOS

This authority, such as it was, actually was far from final in view of the fact that the WAAC Pre-Planners were immediately dropped down at least two echelons in the reorganization of the War Department on 9 March 1942. Many of the Chiefs of Services who had formerly reported directly to the Chief of Staff, now were grouped under the command of the Services of Supply. The WAAC was one of these agencies. The Pre-Planners were transferred from G-1 Division to the Personnel Division of the Services of Supply, and the directives drafted by them henceforth had to be signed by that command rather than by General Hilldring in G-1.

"WAAC planners no longer had the close guidance of the General Staff during the Corps' formative period, and in fact could not reach it with any ideas which were disapproved by the Services of Supply. At this time the Chief of Staff asked Mrs. Hobby to come to him personally if she had any difficulty which she could not iron out by herself. This privilege proved less useful than it appeared, and was in fact used only two or three times in the Corps' history, since Mrs. Hobby understood that she would not greatly endear herself to the Services of Supply, with whom she must work daily, by going over their heads on every matter in which they disapproved her proposals. Even the existence of the authority was considerably resented by them. Later events were to prove that from this time onward General Marshall was aware of only the most conspicuous of the WAAC's difficulties. Nevertheless, WAAC planners united in giving great personal credit to

the Assistant Chief of Staff, G-1, General John H. Hilldring, for the fact that in the following hectic weeks they actually did complete full plans, workable if not perfect; General Hilldring repeatedly stepped down from his echelon to give planners more of his personal time and advice than the insignificant WAAC organization could have expected from its current importance to the war effort.

The SOS upon receipt of the WAAC promptly delegated WAAC planning to the various SOS divisions which did similar planning for men. For example, the SOS's Training Division received authority to establish policies for the training of all WAAC officers, auxiliaries, and units. In actual practice this directive apparently did not make too much difference, since other divisions did not have the personnel or the inclination to do actual planning, and contented themselves with approving plans worked out by the Pre-Planners. Thus, the general nature of the subsequent WAAC plans seems to have been worked out in joint conferences, put in writing by the Pre-Planners, and approved by various SOS Divisions.

British-Canadian Experience

Mrs. Hobby's first step, even before the arrival of most of her staff, was to pause and assess the experience of the British and Canadian women's services, already well-established. During the first days of March she visited Canada, accompanied by Major Tasker and the Commandant-elect, and was afforded the opportunity to talk to leaders of the Canadian WAC (CWAC) and of the Women's Division, RCAF, as well as to British women officers then visiting in Canada. She also later dispatched Major Macy to England to collect references and histories.

The visit did much to restore Mrs. Hobby's morale, which had been much depressed by the opinions of most older U.S. Army officers, who had told her unanimously that a women's corps could not succeed. On the other hand, every Canadian staff officer and post commander to whom she talked told her that he had experienced initial doubts but was now enthusiastic about the value of women in his command. British officers likewise reported the success of their women's services in spite of very extensive early hardships.

The most conspicuous lesson of the British services was that the civilian auxiliary organization was notably inefficient and friction-provoking. Already two of the three major British women's services had been admitted to full military status. In Canada, Mrs. Hobby noted that the Women's Division of the Royal Canadian Air Force, which was actually *in* the RCAF, had fewer administrative difficulties and was more favorably regarded by male commanders than was the Canadian WAC (CWAC), which was only an auxiliary *with* the Army. Male commanders heartily disliked separate command channels, separate rules, and separate status for female members of their station complements, and in fact the CWAC was to be admitted to full Army status within a few months, and the Canadian WRCNS, just being organized, never attempted to operate without full Navy membership.

Mrs. Hobby therefore proposed that an amendment be immediately added to the WAAC Bill before its passage, placing the WAAC *in* the Army and giving its members full military status and discipline.

The War Department was not enthusiastic about this change, and Mrs. Rogers objected also on the assumption, which proved quite correct, that the attempt would merely delay the Bill's passage and would not be accepted by Congress even after the delay. Nevertheless, Mrs. Hobby insisted that the amendment at least be considered by the committee, and consideration was finally agreed upon, a step which was to delay passage of the Bill until May.

Officer Selection

The British precedent was quickly reflected in other plans, chief among which was the selection of officers. Mrs. Hobby and Colonel Mudgett at once discarded previous plans for her to appoint Assistant Directors and to select 100 officer candidates. The number of applications now on file from individuals with prominent sponsors indicated that, were appointments direct, the WAAC might be forced to repeat the British ATS mistake of commissioning such women in such numbers that forcible retirements would later be necessary. The shortage of capable women officers had been judged by the British to be a major contributing cause of all other difficulties and hardships, and the Auxiliary Territorial Service (ATS) had come to the conclusion that selection by means of Officer Candidate boards and schools was the best means of producing women officers able and willing to care for their troops effectively. Accordingly, Mrs. Hobby formed a basic policy from which she was never thereafter to swerve: That of Corps democracy. It was decided that all officers, even Assistant Directors, were to be graduates of Officer Candidate School and not direct appointees; after the first class, all officers would come from the ranks. Mrs. Hobby also decided now that selection of the initial class should be by impartial Army machinery, and not by herself or any other individual. Negroes were to be included in the same proportion as in the Army.

Accordingly, the Pre-Planners hastily prepared and sent to the printers very detailed instructions for Corps Areas to follow in selecting Officer Candidates. To determine qualifications, Mrs. Hobby secured the advice of a conference of eight prominent psychiatrists, plus that of The Adjutant General's battery of test construction experts, to help devise a method of screening for mental stability which would eliminate unstable applicants. By these means the WAAC Pre-Planners confidently expected to avoid the British mistakes and to build the WAAC upon an extremely strong group of officers selected on merit and not on political or social grounds. All Corps Areas were alerted to expect instructions and application forms by airmail immediately upon passage of the Bill, and were given a military schedule whereby date of passage was designated "D-day." The first officer candidates were to be selected and at the school by D+47.

The WAAC D-day now bore down upon the Pre-Planners. The WAAC Bill passed the House of Representatives on 17 March by a vote of 249 to 86, authorizing an auxiliary corps only, and was sent to the Senate, which had promised to consider full Army status.

Training Center

For several frantic weeks it appeared impossible to find a training center. As the search continued, it was found in general that all large universities were training so many Army and Navy technical specialists that even their gymnasiums and classrooms were converted to barracks; all small colleges could accommodate only a few trainees; and most suitable resort hotels had been taken over by the Air Corps or would have had to be condemned at a prohibitive price.

At last, in late April, the declining fortunes of the horse cavalry made possible the use for Waacs of an old horse cavalry post, Fort Des Moines, in Iowa, now harboring a Reception Center which might be moved to nearby Fort Dodge. Fort Des Moines was near the geographical center of the United States; had no major defense projects in the area; would present no race and color difficulties; had suitable utilities to handle expansion to 5,000 population; and already had room for 1,000 and suitable administration, supply, and recreation buildings.

It was attempted to get immediate authority to start alterations at the post, but this was not possible to grant until the passage of the Bill. It was at least possible to bring into the planning group nine Army officers to be indoctrinated before going to Fort Des Moines as a nucleus of the staff. Since it has been found necessary to replace the officer previously selected as Commandant, G-1 Division now attempted to give the WAAC an officer of outstanding ability. The man selected was Colonel Don C. Faith, a Regular Army officer of twenty-five years experience with troops, recently in the War Department's G-4 and G-1 Divisions.

With plans for recruiting and a training center thus in as much readiness as was possible, the most distressing problem to the planners was now that of the WAAC uniform. Mrs. Hobby believed that the WAAC uniform should be identical with that of the Army in color and as much like it in design as possible, especially in view of her pending attempt to place the WAAC in the Army. The battle for blue versus olive drab continued for some time, and was finally resolved by the Philadelphia Depot, which wished to use O.D. and Khaki material already procured and deemed it madness to start procuring two more shades of blue. Slacks had originally been a part of the outfit, but they were rejected as too troublesome to fit. Since at this time it was believed that the only outdoor work which Waacs could perform was that of motor transport, no trousers except coveralls were believed necessary.

After considerable effort, the planners agreed upon the most essential items of a uniform, which they were prepared to present for approval to the General Staff on the day following passage of the Bill. Although much later criticism was incurred by the WAAC uniform, the fault did not lie in the designs now chosen, which were excellent and never had to be altered, but rather in later difficulties with materials, sizing, and mass-production. In ignorance of the future expansion of the Corps into many fields of work, however, they had omitted to design many work garments which were later to be badly needed.

Plans for housing were less urgent, since field companies would not be ready for assignment for several months. Mrs. Hobby attempted to make changes in housing plans; on the basis of British experience and of her conferences with psychiatrists, she feared that women might not react to communal living exactly as did men. She therefore proposed that Waacs get room-type dormitories, two persons to a room, of the type used to house civilian women workers. She was quickly overruled on this point by Army Engineers on the grounds of economy and feasibility. Instead, it was planned to use existing barracks, with minor modifications, or new construction like the old. Over the WAAC planners' objections, Army building authorities also, for reasons of economy, eliminated plans for WAAC officers' quarters similar to men's, and placed the officers' rooms in the combination orderly-room, supply-room, and day-room building, a change which was later believed to be a contributing cause of excessive company-officer fatigue.

Unit Organization

Only one major phase of planning remained: That of the composition of units, and their allocation. It was decided that post headquarters companies would consist of 147 auxiliaries and 3 officers and that Aircraft Warning Service Operations and Filter companies would be somewhat smaller. The problem was how to devise a fixed company with one Table of Organization which would suit all stations, since not all could use the same number of typists, drivers, or other workers.

The Pre-Planners later noted, "The bulk allotment system would have saved

us many a headache on this problem." Unfortunately, the bulk allotment system was not yet worked out, and Pre-Planners were forced to try to set up an inflexible T/O unit which would meet the needs of all stations using Waacs. One Table for Filter Companies, and one for Operations, were set up. For the more difficult Post Headquarters unit, planners hit upon the idea of having five types of platoons: Clerical, Communications, Service, Machine Record, and Miscellaneous. It was believed that almost any station, large or small, could meet its needs by requesting the proper assortment of platoons in its WAAC company.

Corps Areas which had asked for Waacs were now requested to specify the assortment of platoons desired, and planners optimistically proposed to recruit skills exactly to specifications, since a woman with no skill or with some odd skill would not fit into any platoon and so could not be assigned. Only already-skilled women were sought; it was not proposed to waste time taking women who needed technical training, except that brief courses in Army driving, Army cooking, and Army clerical work would be given to some women at the basic training center, to help adapt their civilian skills to the military.

Although supposedly soothed by the assurance that no WAAC Post headquarters units would arrive for some time, or until further warning, many stations in the field now became extremely nervous, and it was decided that Major Tasker or some other representative of the group must visit each designated station to prepare them for Waacs. In carrying out this indoctrination, Major Tasker later found many stations in a state of virtual siege, throwing up barbed-wire entanglements around WAAC areas, and setting aside separate nights for Waacs to use post theaters and service clubs, so that men and women could be kept isolated from each other. Many post commanders were found much opposed to having Waacs on the post, and all, of course, were totally ignorant as to the nature and proper utilization of such a unit.

In their drive to complete all plans before passage of the legislation, planners were seriously handicapped by uncertainty as to the type of Bill which would pass Congress. After the WAAC Bill had passed all committees and the House floor, thus virtually assuring it of passage in some form, the Navy had introduced a bill to establish the WAVES *in* the Navy and not as an auxiliary. True to the Navy's prediction, the brunt of argument had been borne by the Army, and the WAVE Bill passed the House without difficulty. It therefore seemed only reasonable that Congress would approve the amendment to place women *in* the Army. The unhappy planners were therefore forced to make two sets of plans: one for an auxiliary and one for an Army corps.

A still greater handicap to planners was the War Department's continued delay in making a decision as to the WAAC's status, an omission which first became alarmingly evident soon after the transfer to the Services of Supply. Incredible as it might seem, there had never been any written decision on two vital matters: (1) whether control of WAAC policy was to be vested in the Pre-Planners and later in WAAC Headquarters, or scattered among the agencies which made similar plans for men, and (2) whether WAAC units in the field were to be commander by the Director, WAAC, or by Army commanders.

The need for a basic agreement became more alarming as conferences multiplied and as planners advanced into problems which had seemed superficially simple.

The WAAC Pre-Planners had been acting on the assumption, concurred in by G-1 Division, that the WAAC Director

would command the Corps, as provided in the Rogers Bill. She would thus activate units, order them to Army stations, and approve all transfer, promotion, and discharge of Waacs; the Army stations would merely provide quarters, food, and job supervision. At conferences, other Army agencies now began to take issue with this view. G-3 Division expressed the opinion that Army agencies would have complete command of WAAC units on their stations, transferring them in the United States or overseas without informing the Director WAAC, and likewise discharging, disciplining, and promoting. The Army Air Forces heartily concurred, and demanded complete control of their AWS units; they actually went so far as to issue orders activating certain AWS units which they proposed to fill from volunteers already working on operations and filter boards, for whom they desired that the Director do little more than contribute uniforms. By 3 April the situation was so confused that the Pre-Planners appealed directly to the Chief of Staff pointing out these differences, and asking an official interpretation of the Rogers Bill. They stated: "Confusion exists as to the interpretation of the sentence in the Bill which says, 'The Director shall operate and administer the Corps in accordance with normal military channels of command and administration.'" The planners believed that this gave command powers to the Director, and merely required her to set up a normal military chain of command among the Waacs, from herself to regional directors to company commanders.

Immediate decision on this vital matter was delayed pending Congressional action on the amendment to the Rogers Bill, which would have solved all question of command by putting the WAAC in the Army. The Pre-Planners and the Services of Supply united in recommending adoption of this amendment. The Services of Supply favored full military status for women because this would give men and women equal treatment for equal work. Mrs. Hobby favored it for similar reasons, and also because she feared that the Rogers Bill was about to give her public responsibility without authority; in the eyes of the nation the present Bill appeared to make her the women's commander, responsible legally and morally to their families for their well-being.

In spite of this question, the War Department did not push the amendment for equal status. Comment on the floor of the House of Representatives was most unrestrained and caustic; members objected strenuously to placing women in the Army because this would give them the disability benefits and pensions which men received; some also feared that women generals would rush about the country dictating orders to male personnel and telling the commanding officers of posts how to run their business. Curiously, this opposition was not tempered in the least by the fact that the House had just passed and sent to the Senate the bill placing the WAVES *in* the Navy with all of these benefits, even though, as members pointed out, Congress was now in the incongruous position of giving Waves the full protection of military status while forbidding them in their Bill, to go overseas, whereas the WAAC Bill allowed women to go overseas without the protection of military status. Opinion in the Senate Committee was divided, but members finally became convinced that great delay would result from any attempt to change the Rogers Bill.

It was shortly apparent that Congress would pass the Rogers Bill immediately without any of the proposed amendments. The War Department and the WAAC planners waited, braced for the outburst of publicity and the need for furious action which they knew must accompany the Bill's passage—the appointment of the Director, the beginning of recruiting, and

the opening of a training center. Their plans were complete, as far as human guesswork could foretell the future; the War Department experts on recruiting, clothing, testing, training, had all been consulted; the fiscal, legal, and administrative authorities had spoken; the oddly assorted little group of WAAC planners had done their best to assemble the patchwork of pieces into a coherent whole. Men who had never seen an enlisted woman, and women who had never been one, had together planned for the future welfare and efficiency of women who were to be enlisted to work for the Army. The WAAC's success or failure would now be largely up to these women.

On 14 May 1942, the Rogers Bill was approved by the Senate, 38 to 27, and when signed the next day by the President, became Public Law 554, an Act to establish a Women's Army Auxiliary Corps for service with the Army of the United States.

There is a growing demand (in 1943) for WAAC's services throughout the Army. Enlistees represent the highest type of American womanhood and as a whole the women have maintained the highest standards in every respect. They have fulfilled their duties in an efficient and business-like manner and have been a definite asset to the Army. Each woman enrolled in the WAAC has postponed the induction of a man since they are counted as a man in computing the ultimate manpower requirements of the Army.

A little over a year after the Corps (WAAC) was established, more than 65,000 women were members and are serving in more than 240 posts, camps and stations in the United States and abroad. In the 155 specialists jobs they have taken over they have fulfilled their primary purpose of releasing able-bodied men for active duty on the fighting front. In addition, a number have been shipped to overseas stations and are performing valuable functions in activities as chauffeurs, and in administrative capacities at the various headquarters. Plans for the increase of the Army during the calendar year of 1943 provide for approximately 150,000 WAAC's, an equivalent in size to almost 10 divisions of soldiers released for combat duty.

On July 1, 1943, the President signed a bill changing the status of the Corps from an auxiliary serving with the Army to a component of the Army and giving the members the right to Army ratings, grades, privileges, responsibilities, and benefits.

General of the Army George C. Marshall, in the Biennial Report of the Chief of Staff, USA, 1941-1943.

The Concept of Airborne Forces

Lieutenant Colonel W. A. Kuhn, *Infantry*
Instructor, Command and General Staff College

THE increased tempo of modern warfare as well as the rapid advancement in aircraft have made movement by air the concern of all army field forces as well as airborne forces. Developments in troop and cargo carrying aircraft are fast making possible an era in which movement by air will become an effective alternate method of dispatching armed forces into theaters of operations and combat. The military responsibilities involved in the administrative and tactical movement of troops by air will eventually be regarded as part of normal staff duties.

This will require, on all levels of command, a sound knowledge of the concepts governing the employment of airborne forces. Until this has been achieved throughout all army field forces, commanders may have to depend on skilled airborne specialists for counsel and guidance in this modern method of transportation.

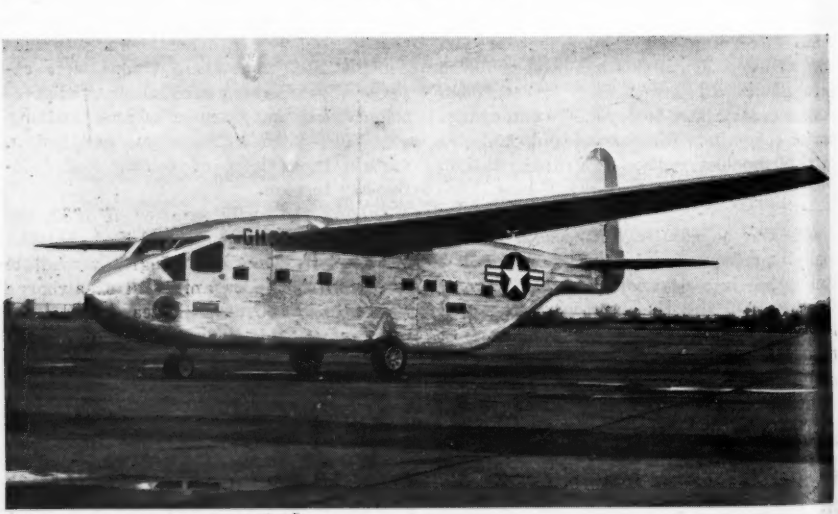
Early Air-transport of Troops

As early as 1931, the Russians, British and American Armies were developing techniques in air-transport of small units. During 1935 the Russians made the first large scale movement of troops by moving two divisions from Vladivostok to Moscow, a distance of 3,500 miles. The Russian and British Armies, taking the initiative, developed airborne technique to such a degree that by 1936 both nations were actually employing small parachute forces in field maneuvers. The Germans, though curbed by the Treaty of Versailles, were also developing doctrine in the air-transportability of troops and equipment. On 12 March 1938, in conjunction with Hitler's coup in Austria, strong German forces were air-landed at Aspern Airport in Vienna. The following October, a complete German Infantry regiment was moved into Silesia in Junker transport-type aircraft. These operations demonstrated to the world that combat troops could be successfully transported by air. The Germans further demonstrated that these troops were capable of performing such missions as sabotage, disrupting lines of communications, obtaining vital information, and within certain limitations, of seizing and holding key terrain.

During the early summer of 1939, the Chief of Infantry suggested that the War Department General Staff give immediate attention to the organization of airborne forces in the United States Army. The Chief of Infantry contended that such a force should be composed primarily of infantry soldiers. After all, airborne troops

Airborne troops are governed by the same principles of war as other armed forces, but their means of transport presents some capabilities and limitations which affect plans for their operational employment

The CG-4A gliders, above, were used in airborne assaults in the European theater; each glider carried 13 men and the pilot and co-pilot, but the type is now obsolete. Below, the XCG-18A is the new all-metal light assault glider which carries 30 men in addition to the crew.



The C-47 Skytrain, above, is now obsolete, but saw much service in World War II; it carried 20 parachutists and 7 equipment bundles. The C-119, below, is the latest version of the C-82 Packet or "Flying Boxcar," carries 42 combat loaded parachutists and 20 equipment bundles.

would be required to fight on the ground the same as other ground units. On 2 January 1940 the War Department directed him to conduct a preliminary study and submit a general plan for the new airborne project in our army.

While the initial studies and tests were being conducted in the United States, the German *Blitzkrieg* was sweeping across the lowland countries of France, Belgium and Holland. In May 1940 the Germans scored another victory by the employment of parachute troops to capture and secure key bridges in the vicinity of Moerdijk, Holland, thereby facilitating the advance of friendly armor. This action conclusively illustrated the ability of airborne forces to seize an area in support of and in conjunction with other military operations.

Again in May 1941 the Germans jarred the minds of military men the world over with the airborne invasion of the Island of Crete. This was the first time that airborne forces had participated *en masse* in a combined land, air and sea operation. The ability to land all of the arms by air and permit sustained action in destroying organized resistance was brilliantly demonstrated.

United States planners, aided by the information gained from these operations, concluded that a strong, well-balanced airborne force comprised of parachute, glider and air-landed elements could be profitably employed. With this concept of such a force, the airborne program in the United States Army went forward by leaps and bounds.

During World War II the airborne forces of the United States Army were committed in the primary airborne role on fifteen different occasions. Operations on a battalion scale were conducted in North Africa; on a regimental scale in Italy, New Guinea and in the Philippine Islands; on a division scale in Sicily and in the invasion of Southern France; and on a corps scale in Normandy, in Holland and in the crossing of the Rhine at Wesel. Plans were in progress for employment of an airborne army deep in enemy territory when the Germans capitulated in May 1945.

Air transportation of troops, equipment and supplies was not confined to any particular theater during World War II. Military archives are replete with reports of air-transported operations in New Guinea, Burma, India, China and in the European Theater of Operations. General Marshall, then Chief of Staff of the United States Army, made a statement in his Biennial Report to the Secretary of War 1943-1945, to the effect that if it had not been for air-transported operations in the China-Burma-India Theater, the war effort in that theater might have failed.

Airborne Divisions in ETO

Airborne divisions during World War II were considered as strategic troops; however, they were limited in employment exclusively to tactical roles. They were committed in support of other operations such as amphibious landings and ground offensives. Although the presence of airborne forces in the theater of operations presented a constant threat to the enemy that forced him to take proper defensive precautions in order to protect his vital installations, the strategic influence of this action was of relatively minor significance.

The European Theater of Operations provided the terrain for the greatest number of airborne assaults by United States airborne divisions. The troop basis in this theater included four airborne divisions of which three saw combat.

Of the several types of combat missions enunciated in field manuals, only four, as described below, were assigned to these units.

a. Seize, hold, or otherwise exploit important tactical localities in conjunction with or pending the arrival of other forces. This was the general mission of the 82d and 101st Airborne Divisions during the

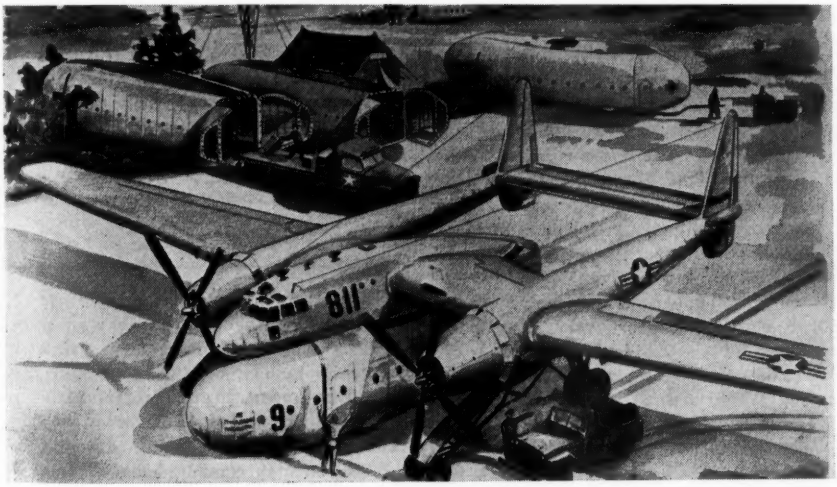
invasion of the Contentin Peninsula on 6 June 1944. Another classical example of this type of mission was the airborne phase of OPERATION MARKET-GARDEN which included the 82d and 101st Airborne Divisions, and the British 1st Airborne Division. This plan, as conceived, envisioned seizure of vital bridges of the Maas, Waal and lower Rhine Rivers, thereby establishing, in effect, a corridor along which the ground elements of the British Second Army could advance.

b. Attack the enemy's rear and assist a breakthrough or landing by the main force. OPERATION VARSITY, the Rhine River crossing by the 17th Airborne Division on 24 March 1945, illustrates this type of mission. The operation was executed in conjunction with the British 6th Airborne Division and the ground element of the British Second Army. This type mission was also the secondary effort of the 82d and 101st Airborne Divisions on 6 June 1944 in Normandy where they seized the beach exits and assisted the landings of the 4th Infantry Division.

c. Block or delay enemy reserves by capturing and holding critical terrain features. This was the subsidiary mission in all of the operations cited above. The airborne assault of the First Airborne Task Force in the invasion of Southern France is an ideal example of this type of mission.

d. Capture or destroy vital enemy installations, thereby disrupting the enemy system of command, communications and supply. Combat missions of this type were subsidiary actions in the first two examples described above.

Missions involving the primary effort of capturing enemy air fields and delaying the retreating enemy were planned on several occasions but were never executed.



The outstanding feature of the new XC-120 pack-plane is its detachable fuselage. It is designed to carry a payload of 9 tons at a 2,000 mile range.

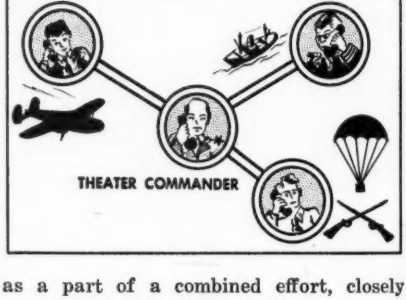
The airborne divisions were constituted entirely from volunteers, highly trained individuals, possessed of initiative and aggressiveness. These units displayed superior fighting qualities and accomplished the most difficult missions with distinction. The varying degree of success attained in performance of primary missions in each airborne operation was primarily dependent on the accuracy of the parachute drop and glider landings in the objective area. Once assembled on the ground, all units accomplished their missions with alacrity and thoroughness.

Basic Concepts

The handling of airborne troops is governed by the same principles of war which apply in the employment of any other type of armed force. Their means of transport to the battlefield, however, gives them special characteristics reflected in capabilities and limitations, which affect the plan for their operational employment. Many of these characteristics will change as the development of aircraft and airborne equipment progresses. The basic concepts for the employment of airborne forces, as conceived from experience gained during World War II, remain unchanged.

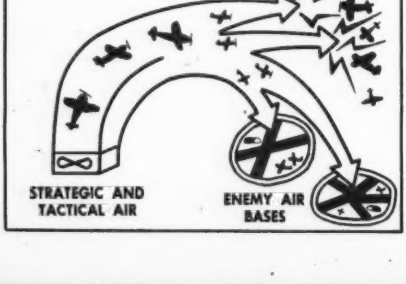
a. The first concept is based on attainment of air superiority as a fundamental prerequisite before an airborne operation can be launched successfully. The vulnerability of airborne forces and troop carrier aircraft to enemy aircraft and antiaircraft fire makes air superiority essential in order to provide maximum protection in the marshalling areas, during the air movement and in the objective area. Airborne operations with airlifts lasting over an extended period of time require a greater degree of air superiority than an airborne operation with concentrated lifts.

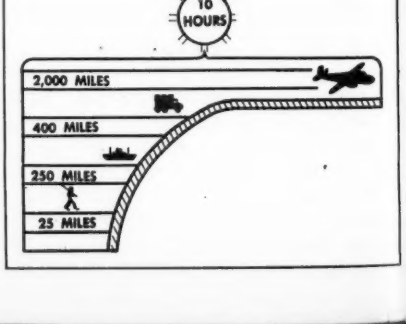
b. The second concept is that airborne operations require a high degree of coordination between the air, ground and naval forces. Airborne forces should be employed



as a part of a combined effort, closely coordinated with other military or naval forces. Airborne forces are primarily strategic in employment and therefore should be under theater control for overall planning and supervision. This concept places airborne forces directly under the theater commander who alone is able to coordinate the ground, air and naval forces in his theater.

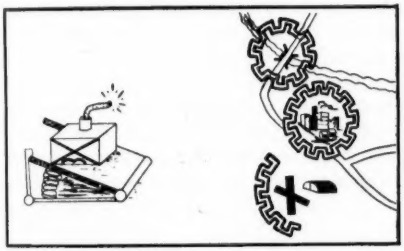
c. The third concept envisions the use





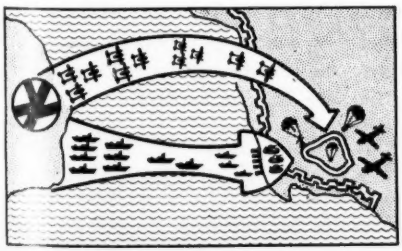
of the inherent speed of the airplane to overcome distances and geographical barriers. This strategic mobility, made possible by the speed, range and flexibility of aircraft, gives the airborne force a wide choice of objectives.

d. The fourth basic concept indicates the use of airborne forces which are not committed to action but by threat of employment compel the enemy to disperse his



defense forces and facilities to protect vital installations. The mere maintenance of an airborne force in being, close to air fields, may tie down large numbers of enemy troops in protection of his lines of communications, particularly if these are already extended.

e. The fifth concept advocates the use of airborne forces in invasion-type operations, in which airborne units are normally used to make the initial assault. This was a classic use of airborne troops and one that was fully exploited during World War II. It must be remembered that airborne forces are especially trained and highly qualified troops and should not be wasted on missions which can be performed more expeditiously and economically by other ground forces.



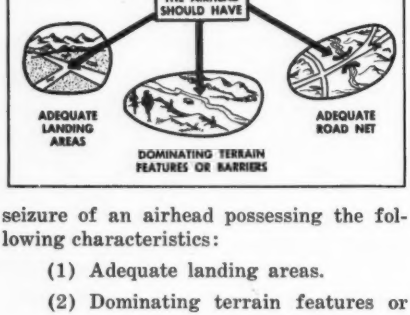
f. The sixth concept is closely associated with the previous concept and is in fact a corollary to it. This concept maintains that when airborne troops are employed in conjunction with ground or amphibious forces, the airborne effort must contribute maximum assistance to the main effort. Airborne assault will normally precede the ground or amphibious attack; however, the possible variations in the employment of airborne, ground, and amphibious forces are endless.

g. The seventh concept is a combination of two principles, i.e., mass and surprise. In order to obtain maximum effectiveness from airborne operations, the airborne force must be employed in mass, effecting surprise, and landed as rapidly as possible in the smallest practicable area. Surprise is achieved in several ways, i.e., by secrecy regarding projected operations, by deceiving or misleading the enemy, by the inherent rapidity of air movement, and by obtaining local superiority over the enemy. To exploit the initial surprise gained by airborne assault every effort must be made to land the bulk of the airborne force as rapidly as possible in as small an area as possible. Mass employment of airborne forces is calculated to overwhelm the enemy before he is able to react to the airborne attack and prepare an effective defense or counteroffensive. This concept is probably the most signifi-

cant in the employment of airborne assault and should be fully exploited.

h. The eighth concept concerns the timing or hour of landing for an airborne operation. This concept is based on the present navigational aids and methods by which accuracy of landing is obtained in the objective area. Airborne operations will normally be conducted under daylight conditions, sacrificing the tactical surprise of night landings for the accuracy gained by daylight landings. However, this does not preclude the execution of specific missions at night when required to give maximum assistance to the main effort.

i. The ninth concept refers to large scale airborne operations involving the



seizure of an airhead possessing the following characteristics:

(1) Adequate landing areas.

(2) Dominating terrain features or barriers which facilitate defense of the airhead.

(3) Adequate road nets connecting the landing areas, the objectives, and the dominating terrain features.

What of the Future?

It is not unreasonable to believe that, with the development of high-speed means of communications, "time" as a factor will exercise great influence on warfare of the future. Maintenance of airborne forces superior in training and equipment to those of any potential enemy would give us the advantage of having immediately available a highly effective striking force. Securing its bases of operations, providing the means for air-transport and furnishing an adequate escort force that can see it safely to the objectives require precious time.

The airborne forces of the future will emphasize their strategic employment. Such employment will be influenced by the following factors:

a. Progressive developments in aircraft and airborne equipment.

b. Further developments and promulgation of airborne doctrine.

c. The recognition and appreciation of the potentialities of airborne operations by high level planners and commanders of the future.

Full development of airborne warfare does not change the age-old principles of war but gives a further means of attaining the same end, i.e., making possible a third-dimensional turning movement to destroy the enemy's base and lines of communications, and thus destroy the enemy forces in the field. This may be the new means whereby a commander can gain his object.

Brigadier J. M. Calvert, Great Britain

The Need for a Permanent Transportation Corps

Colonel N. H. Vissering, *General Staff Corps*
Office of the Assistant Secretary of the Army

AT this time when the desirability of making the Transportation Corps a permanent part of the army and certain modifications in its functions and organization are being considered as a result of the integration program, it is well to take stock for a moment of the situation which existed before Transportation became a separate Corps and factors which dictated this decision.

The birth of the Transportation Corps came about as the result of a realization on the part of General Brehon B. Somervell and other high ranking staff officers in the War Department that transportation was probably the most difficult problem in logistics requiring immediate solution if our overseas forces were to be supplied adequately.

Prior to the beginning of World War II, the operation of transportation was handled principally in the Office of The Quartermaster General. The Army Transport Service, which at that time had twelve army transports and an approximately equal number of chartered vessels, functioned under the guiding hand of Major General Clarence H. (Sandy) Kells (then a Lieutenant Colonel); a Commercial Traffic Branch, which issued rail routings, arranged special trains, etc., functioned under Colonel Edmund Lasher (then a Major); motor transportation was under Brigadier General James L. Frink. The operation of military railroads was a function of the Corps of Engineers. Transportation activities received General Staff direction from a small Transportation Section of G-4, headed by Major General C. P. Gross (then a Colonel), who later became Chief of Transportation.

The ports of embarkation were under the command of the Corps Areas in which they were located, and a cumbersome, time-consuming procedure was required to get orders issued and delivered from the War Department to the port commanders. This situation soon became intolerable, as the tempo of troop movements increased, and it was decided that the ports would function under the direct command of G-4, War Department.

At this point it is well to mention one of the basic lessons learned by those who were responsible for over-all logistical planning for the Army, namely, that transportation transcends corps area and theater boundaries and the same office must be responsible for coordinating the movement of troops and supplies from the

In support of a permanent Transportation Corps, the writer declares that "experience in two world wars dictates that control of both rail and water transportation must be consolidated under one head."

time they leave their home station or depot until they are delivered overseas.

When the Japanese attacked Pearl Harbor our handful of Army transports were en route to various overseas destinations, including the Philippines. Several of these vessels were sunk, others diverted en route to other destinations such as Australia, and some, like the *Lumber Lady*, which had a cargo of critical engineers' supplies for Canton Island, took off on their own to safer areas. There was great concern on the part of the War Department General Staff over certain critical cargoes, as our ability to resist future Japanese attacks was largely dependent on the safe delivery of vital equipment. Even the Secretary of War himself personally looked over the manifests of certain ships.

At this time, none of the SOP's for movement of troops and supplies, which later facilitated efficient movement, were in existence. Directives on marking and description of supplies were woefully inadequate. The Supply Branch, G-4, valiantly endeavored to arrange for the replacement of cargo lost at sea by reviewing ships' manifests. It was impossible, however, to make replacements from such inadequate descriptions as "five cases ordnance supplies." Inevitably many badly needed items failed to arrive in time, whereas certain other less essential items were duplicated.

Amongst the cargo which was afloat at this time was a shipment of two hundred airplanes for the Philippines. This shipment was diverted at sea to Australia, where the planes were hastily assembled, but it was impossible to make them operational in time to take part in the subsequent Philippine conflict because certain vital parts for the machine guns and Prestone for the engines had been loaded on another vessel. This bitter lesson led to acceptance of a cardinal principle which became a basic doctrine of the Transportation Corps, namely, "no piece of technical or combat equipment could be loaded at ports of embarkation until qualified technicians had determined that all of its component parts were on hand and that everything required to insure the operation of this piece of equipment could be loaded on the same vessel." We learned the hard way on these early shipments, but the experience thus gained paid big dividends later.

It was obvious to the General Staff that some system must be evolved immediately to replace cargo lost at sea with a minimum of delay. It was obvious that the channelling of all these details through Washington would be too slow, even though the voluminous records required to make such replacements were forwarded from the ports. It was, therefore, decided to establish at each port of embarkation an Oversea Supply Division, which was, in effect, a miniature Army Service Force (ASF) with representative sections from each of the supply services.* These Oversea Supply Divisions also permitted decentralization and expedited movement of supplies as each port was made responsible for specific overseas areas, received and processed their requisitions, and assembled and kept records of shipments.

In the absence of standing operating procedures, which were developed later, the first sizable movement of troops from home stations to the ports were coordinated by phone by one or two officers in the Transportation Section of G-4. While these rather intricate moves (such as that of Task Force X, which went to Australia partially from the East Coast and partially from the West Coast) were accomplished substantially according to schedule, there was considerable confusion in the various command echelons involved and the section of the QMG's office which was responsible for issuing car routings,

* See "The Oversea Supply Division at Ports of Embarkation" by Major C. E. Rochford in the MILITARY REVIEW, June 1948, page 27.

etc. It was obvious from these early moves that control of all phases of transportation—including actual command of the ports—must be concentrated in some office immediately adjacent to the General Staff Divisions concerned in order to facilitate rapid coordination and insure that full instructions governing any movement were issued simultaneously through command and technical channels. The answer to the problem was the activation of the Transportation Corps and the delegation to it of certain broad authority not normally given to a technical service.

As shipping was the prime limiting factor on the movement of troops overseas, conferences were held almost daily between representatives of the Office of the Chief of Transportation and the Operations Division, War Department General Staff (OPD). It is interesting to note that following the activation of ASF and the Transportation Corps, OPD demanded the right to contact the Transportation Corps direct for advice on all shipping matters. It is likewise interesting to know that representatives from Plans Branch, Office of the Chief of Transportation, also accompanied the President on his important conferences with Churchill and Stalin.

Throughout the war the Army was represented by Transportation Corps officers at frequent conferences with the Navy and the War Shipping Administration where vessels were allocated for particular purposes. Occasionally disputes arose as to priority of requirements which had to be referred to the Joint Chiefs of Staff for decision.

By far the majority of the ships utilized for moving military cargo were merchant vessels owned or controlled by the War Shipping Administration and crewed by civilians. When the writer left the Water Division, OCT, 1 January 1944, we had more than 1,000 cargo vessels engaged in moving Army supplies. Army or Navy owned transports were a very small minority.

It is emphasized that in order to supply large armies overseas much detailed planning must be done. The absolute availability of ships must be ascertained well in advance and cargo moved to the ports in balanced lots so as to meet these ships when they arrive. Failure to do this quickly results in port congestion and unloading delays on rail cars which are also a critical factor in any war effort.

During World War I, very serious congestion occurred in the port areas owing to the lack of centralized, efficient movement coordination. To prevent an absolute breakdown in the nation's inland transportation system, it was necessary to dump thousands of tons of Army supplies in open areas close to the ports. Terrific confusion, waste of effort and supplies ensued subsequent to this dumping, and many items failed to reach their destination before the close of hostilities. There was a distinct danger that this situation might be repeated in early 1942. However, profiting by our experience in World War I, a system was instituted whereby troops and supplies could only move to the ports "on call' by the port commander. Under this system, when a movement was approved by the General Staff, orders were issued through command channels to a unit's home station directing that a certain unit be prepared to move to a specific port on or about a given date. These orders contained a provision to the effect that the actual movement would be effected upon receipt of a confirming call from the port commander signifying that his port was ready to receive the unit. Prior to issuing such an order, the General Staff consulted the Office of the Chief of Transportation to ascertain that the required vessels, staging capacity and other requirements could be provided at the port or ports in ques-

tion. Simultaneously with the issuance of this order through command channels, the Office, Chief of Transportation, arranged for the necessary shipping, coordinated the question of convoys with the Navy, coordinated the availability of rail cars with the railroads and, through technical channels, advised the ports and other transportation offices of arrangements made. A similar procedure was followed on the movement of supplies.

To further safeguard against congestion of the ports, a series of holding and reconsignment points were established at strategic locations where supplies or equipment could be assembled for shipment or where they could be sent for temporary storage in the event that certain shipments were cancelled or suspended after actual movement to the ports had commenced. These holding and reconsignment points acted as a surge chamber and provided essential flexibility to our transportation organization. They were particularly valuable in coping with sudden changes in plans, such as when the decision was made to give priority to the OVERLORD plan as opposed to operations in the Mediterranean, and such as the changes which followed the capitulation of Germany when it was decided to divert units and equipment, destined for Europe, to the Pacific.

Our experience in two world wars, therefore, dictates that control of both rail and water transportation must be consolidated under one head if proper coordination is to be effected and breakdowns in supply avoided.

There is inevitably a conflict of interest between individuals who are primarily ships operators and those who are primarily concerned with the movement of cargo. Anyone who is familiar with the internal workings of a commercial steamship line is well aware of the squabbles which frequently arise between the traffic department and the ships operation department. The fact remains, however, that the movement of cargo is what pays dividends in a commercial firm, and that in time of war the delivery of supplies or equipment to the point where they are needed, in such condition that they may be used without delay, transcends all other considerations. There can be no reasons why a job cannot be done. The operators' natural reaction when requested to move a particularly bulky or unusual piece of equipment is that the piece must be broken down into its component parts in order that it may be stowed in accordance with the vessel's construction. The service which is to utilize this particular piece of equipment immediately protests that such dismantling will involve days of delay in the employment of the equipment on an urgent project. Some compromise may have to be effected, but generally speaking a solution which gets the equipment to the job with the least delay must be adopted.

During World War II, the Transportation Corps was composed of a combination of professional soldiers, who appreciated fully why a job had to be done, and civilian transportation experts, who could figure ways and means of getting it done. This made an ideal team which accomplished many things which formerly would have been considered impossible. A sample of this teamwork is seen in the record movement of semi-assembled airplanes overseas. When the Air Force first posed the problem, the ship operating men insisted that the planes would have to be dismantled and crated. The Air Force protested that such dismantling would cause intolerable delay, would require sending assembly experts overseas who were in short supply, and further that the operation of the planes themselves might be impaired by this dismantling. The Chief of Transportation and his professional soldier-advisors

sided with the Air Force and the operating men were ordered to come up with a solution. The solution evolved was the erection of "mechano" decks on tankers and the development of angle stowage of planes on deck. These ingenious answers to a seemingly impossible problem contributed immeasurably to establishing air supremacy in overseas theaters.

This historical background on the organization and early problems of the Transportation Corps has been mentioned here because there are few officers remaining on active duty who encountered these problems as they arose. The accomplishments of the Transportation Corps are known to many as an imposing mass of statistics covering the quantity of troops and supplies moved during an incredibly short period. Few realize, however, the problems and high degree of coordination required to effect such moves as the combat loading of Task Force A for North Africa or the assembly processing and loading of five ship-loads of tanks in less than two weeks for General Montgomery. Incidentally, the incredible speed with which this shipment of tanks was effected proved to be a decisive factor in the battle for Egypt and enabled the British Eighth Army to effect its victory over Rommel and his African Legion.

The officer who served overseas realizes that his outfit got there and received essential supplies. For the most part, however, he was not concerned with how these deliveries were made as long as he got what was needed. The other fellow's job always appears easy, and unless those of us who were close to the picture in the early days call attention to the pitfalls, there is always a danger that the same mistakes may be repeated and that the smoothly running transportation machine which was developed after much trial and error may be subjected to serious damage through ignorance of the problem.

The burden imposed upon transportation in World War II far exceeded that in any previous war. The truth of this statement is so obvious that no supporting arguments are necessary. Yet as a background for (a) detailed report on the work of the Army Transportation Corps, a brief review of the more important circumstances which contributed to making the transportation task both large and complicated will be useful.

From November 1940 to the conclusion of hostilities in August 1945, the Army inducted more than 10,000,000 men and women, as compared with 3,832,000 during World War I.

More than 7,290,000 passengers were moved by the Army from the United States ports to overseas destinations between December 1941 and August 1945, as compared with about 2,059,000 in 1917-1918. More than 4,000,000 were sent to North Africa and Europe over routes averaging about 3,500 nautical miles, more than 2,000,000 were moved to the Pacific where the shipping lanes ranged up to 6,300 miles, and substantial numbers were transported much greater distances to India and Iran.

Report of the Chief of Transportation.

AN INTRODUCTION to MILITARY GEOGRAPHY

Part I

Colonel H. M. Forde, *Cavalry*
Instructor, Command and General Staff College

The concept of the geographic regions of the world presented in this article is based on A Geography of Man *by Dr. Preston E. James, published by Ginn and Company, 1948. The material and illustrations adapted from Dr. James' book are used with his permission.—The Author.*

General

THE science of geography, like that of astronomy, is concerned with phenomena too distant or too large, in relation to the observer, to be readily comprehended. The geographer is faced with the problem of reducing the large patterns of the earth's surface to a size convenient for study. He solves this problem by concentrating his attention on small localities, establishing comparisons with other similar localities and compiling the results of such studies into a pattern which will permit study of the whole. The geographer progresses from the small to the large, from a locality to a region to a group of areas with similar characteristics.

The professional soldier today is meeting the problems of global politics and global strategy. An understanding of the geographical regions is necessary to satisfy all the operational and logistical requirements of global war. The diversity of these requirements is almost infinite, ranging from types of clothing, food, and lubricants to the varieties of transportation and the means of adjusting the fire of long-range weapons.

Size and Shape

This globe of ours is almost a perfect sphere. The equatorial diameter of 7,926.7 miles is but 26.7 miles greater than the polar diameter. The entire surface area has been computed at 196,950,000 square miles. Of this, 139,440,000 square miles is water. Only 57,510,000 square miles comprise the land area. It is rather startling to learn that the average elevation of all this land above the sea is 2,800 feet.

Seventy-one per cent of the global surface is hidden by the oceans, whose average depth is 12,450 feet below sea level. The visible land masses extend under the surface of the water as continental shelves with depths varying to 600 feet. At this general depth, the edges of the continental land masses drop off sharply to the great ocean deeps.

This separation into continental mass and ocean basin is the distinctive characteristic of the earth when viewed as a globe. The maximum difference between the highest mountain, Mt. Everest (29,000 feet above sea level) and the Mindanao Deep near the Philippines (35,000 feet below sea level) is about twelve miles. This is only 1/330 of the earth's radius. On a ten foot globe this would be represented by one-fifth of an inch. A billiard

ball is actually less smooth than the Earth.

The greatest slope is from the 21,450-foot summit of a mountain in Chile to the Atacama Deep at 24,700 feet, a total difference of about nine miles in a horizontal distance of 180 miles. And this is a slope of but one in twenty, a 5 per cent grade.

The major land masses are included in a hemisphere whose pole is at 47°2N-1°-3W, near the mouth of the Loire River in France. In this particular hemisphere is 90 per cent of the ice-free land, 94 per cent of the population and 98 per cent of the wealth of the world. Truly, this is the "Principal Hemisphere." The unimportant half of the world is practically nothing but the ice-covered Antarctic continent, the South Atlantic, Indian and Pacific Oceans (Figure 1).

Landforms

A casual look at a globe will show that the major land masses are closer to the North than to the South Pole, and that the continents are generally large in the north and smaller in the south. The Americas and Africa show this well. Eurasia tends to comply with the general rule, but its huge size makes it appear to bend around the corners, even when seen on a globe. No single map can give the true size and shape of such a large portion of a globe's total surface.

These continental land masses are more or less tied together by an interrupted chain of mountains. The pattern of distribution is simple but significant. One might suggest that the core of the land masses lies in central and southeastern Asia. From this point, mountain axes extend in three directions. One arm points west, passing through southern Asia, southern Europe and northern Africa, and disappears at the Atlantic Ocean basin. One northern and one southern arm encircle the Pacific Ocean.

The land forms or relief increase in complexity as the size of the area under consideration is reduced. For example, we have just considered the largest, the continents and ocean basins. The next smaller category of landforms are the broad regions of plains, plateaus, hills and mountains which are geographical groupings. The third category consists of the individual topographic forms which characterize a particular locality. As the size of the area is reduced, the geographer can study it in greater detail.

In a brief discussion of "global topography" only the broadest and most general relationships of the various factors can be attempted. For example, the dominating chains of mountains have already been mentioned. Their heights and directions have effects on the shapes of the continental land masses, regional topography and climates. Movement of weather can be blocked by the up-reared mountain chains. The very shape of the land is determined by these same mountains.

In meeting the problems of global politics and strategy in modern war, today's professional soldier must understand the geography of vast regions to satisfy all operational and logistical requirements

Drainage

Most of the world's great rivers either rise in this series of mountain chains or receive most of their water from the mountain water sheds. The exception is the river system of western Russia.

The direction of drainage is dependent on relief. The amount varies with the precipitation. As is true in all topographic discussion there exists an interrelationship of elements which does not permit separate determination and study. For example, the statement was just made

that the direction of drainage is dependent on relief. Yet drainage is one of the most marked erosive means which changes relief. It is valid, however, to consider that at any one time the relief of an area or locality will determine the direction of drainage.

The amount of drainage varies within wide limits. Certain parts of the Lybian desert of Africa and the Atacama desert of Chile have never recorded more than traces of moisture. One of the islands of the Hawaiian Group, Kauai, with an evenly distributed annual rainfall of 476 inches, and Cherrapunji in India with an average of 457 inches, are perhaps the wettest localities.

Most of the moisture falling as rain and snow either runs off the surface of the ground to the streams and rivers or percolates through the surface materials and thence along impervious beds of rock to reappear as springs. The total amount of precipitation provides an indication of the amount of water present as surface drainage.

Surface Materials

The surface materials vary from the hardest rock to the softest silt or powdery dust. All are presumed by present day geologists to be the result of weathering of the basic rocks. How many millions of years have passed since it began no one can determine. The forms in which they now exist, the relief, and the means which have produced the changes are of importance.

Weathering comprises disintegration, from the application of force, and decomposition from the action of water. Disintegration occurs from the expansion and contraction due to alternating heat and cold. The most potent of all forces is frost action, the freezing and thawing of water. In decomposition, the water may actually dissolve the rock or assist in a chemical reaction. Disintegration produces coarse surface materials as rocks and gravels. Decomposition produces our soils.

Each type of rock is parent to a particular kind of surface material. But the existing condition of that surface material depends to a great degree upon other influences, chiefly temperature and humidity.

The study of soils is of great military significance in this mechanized age. Certain types of soils will support heavy loads and provide traction under almost any conditions of weather. Characteristics of other soils will vary with the humidity and temperature in either their load-supporting or their tractive characteristics. Knowledge of the capabilities of these surface materials and a means of recognition are important to the commander and his staff. One of the means of recognition is by determination of the natural vegetation of the region.

Vegetation

The natural vegetation of any area will depend upon the soil as well as the climate. Vegetation also produces the mature soil on which it grows.

The soil may be acid, neutral, or alkaline. With each is associated a particular kind of vegetation. Or the soil may be sandy, alluvial silt, or loess; it may contain much or little decayed vegetation or humus. Again, with each condition is found a characteristic vegetation type. Certain kinds of vegetation flourish in an arid or semi-arid climate. Others demand quantities of moisture to support life. Heat and cold are tolerated in a different manner by various plants.

Here, again, is evidence of interrelationships which cannot be separated, but which can be utilized as indications of other phenomena. Perhaps the one group of phenomena which has the greatest effect on all others is that of climate.

Climate and Weather

Climate refers to the average and range

of meteorological conditions over an extended period of time. Weather refers to the meteorological conditions at a given time or during a short period. Included among the meteorological conditions are temperature, precipitation and winds as of chief importance.

Climate and weather of the earth exhibit certain fundamental laws easily recognized and applied. Generally, weather progresses from west to east in the middle latitudes, and from east to west in the low latitudes. Areas adjacent to the oceans (maritime climate) are subject to a lesser range of temperatures than areas at the same latitude but situated in the interior (continental climate). A maritime climate is featured by a high average of precipitation and a low range of temperature means between the coldest and the warmest months.

A continental climate is characterized by extremes in range of temperatures of the warmest and coldest months. Both the highest and lowest temperature ranges ever recorded were experienced inland, influenced by a continental climate. At the Saharan oasis of In Salah, the temperature rose from 26 to 126 degrees in twenty-four hours. The little town of Verkhoyansk in northern Siberia holds two records. It has the world's greatest range of average temperatures: Minus 58.2°F in January and plus 59.9°F in July, a range of 118.1°. The lowest official temperature recorded on the earth's surface is of questionable distinction. In February 1892 at Verkhoyansk the thermometer fell to minus 93.6°. The maximum summer temperature, at this same place, was recorded one July as plus 93.5°. And that is a greater range of temperature than between melting ice and boiling water.

Some of the effects of climate have been mentioned previously. For example, precipitation or humidity affects drainage,

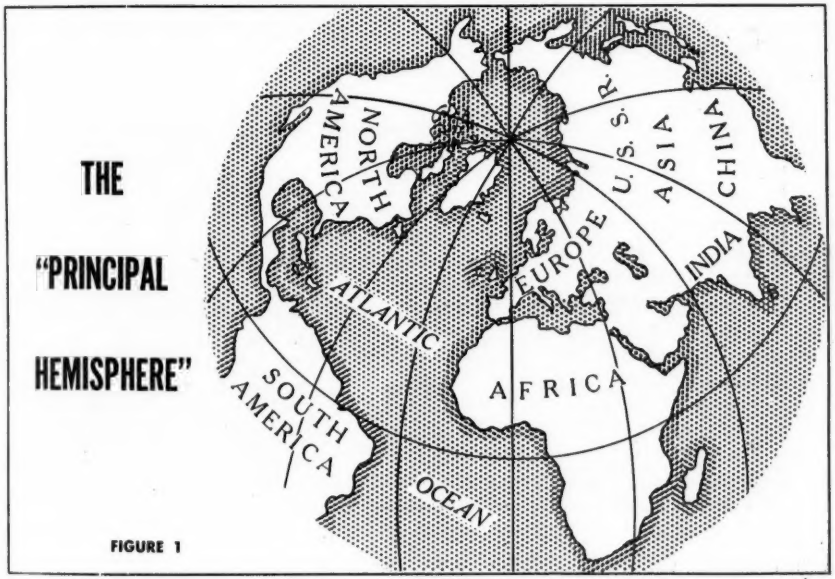


FIGURE 1

the decomposition of the surface materials, and the types of vegetation existing in a particular locality. Similarly temperature affects drainage, soils and vegetation. Winds have an effect upon relief, soils and vegetation, as was painfully demonstrated in the formation of the Dust Bowl in the United States in the mid-thirties.

Because of the apparently systematic distribution of climates and the associated similarity of landscapes, one noted American geographer has used these factors as a basis for considering the earth in groups convenient for study. The division is arbitrary and as the groups are large with indistinct boundaries, many variations can be found. And yet, as with all matters reduced to averages, the exceptions do not destroy the validity of the groupings as a whole. These groups are peculiarly adapted to military purposes. They comprise the dry lands, the tropical forest lands, the Mediterranean scrub forest lands, the mid-latitude mixed forest lands, the grasslands, the Boreal forest lands, the Polar lands and the mountain lands. All the problems of climate, landscape and military use can be considered in each group as a whole.

The Dry Lands
Group I

The outstanding characteristic of the dry lands is a deficiency of moisture. Generally, precipitation occurs as cloudbursts. Frequently, the total annual rainfall of an area may occur in an afternoon. Damage by floods is common.

Temperatures vary with the latitude, or the distance from the equator, and with the time of day. Frost at night may be followed by temperatures exceeding 100° during the next day.

In general, the dry lands are found on the west coasts of the continents between latitudes of 20° and 30° north and south of the equator, and in the continental interiors as far as 55° north latitude. Only two deserts exist on eastern coasts, Patagonia and Somaliland.

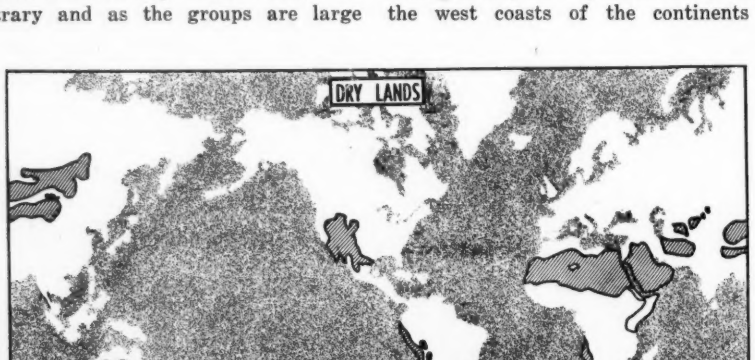


FIGURE 2

There are five great desert areas in the world. The largest extends from the west coast of Africa across Eurasia to the interior of Asia. Various parts are known by differing names, yet all are a part of the desert belt. In other areas of the world the deserts are of lesser extent. In North America the dry lands are found in the southwestern United

States and northern Mexico. In South America the dry lands extend from northern Peru to middle Chile and include a part of the high Andean ranges. Between 20° and 30° south latitude, the desert crosses the mountains to the eastern side and extends to the south into Patagonia. In South Africa the area extends from about 10° south of the equator to 30° south latitude. This area is also on the west coast. Much of Australia is included in this group of dry lands (Figure 2).

Contrary to popular belief, all deserts are not sandy, nor are they devoid of vegetation. Actually most of the lands included in this category are rocky plateaus cut by steep-sided gullies, or basins surrounded by barren, rugged mountains. Vegetation consists of plants whose interior structures permit storage and retention of the meager moisture supply. The typical desert scene includes a cover of low shrubs and grasses.

Plans for military operations must consider how to furnish an adequate supply of water and the methods to be employed for transporting troops and supplies. Clothing which will provide protection from the burning sun in daylight and the chill of cold nights must be provided. Strong winds, dust storms and the glare of sunlight complicate military operations. Except in areas of drifting sands, soil trafficability is generally fair. The sharp, exposed rocks are a definite hazard to rubber tires and footwear.

The deserts or dry lands are definite military obstacles, of great passive defensive strength.

The Tropical Forest Lands
Group II

In almost every respect the tropical forest lands are opposite to the dry lands.

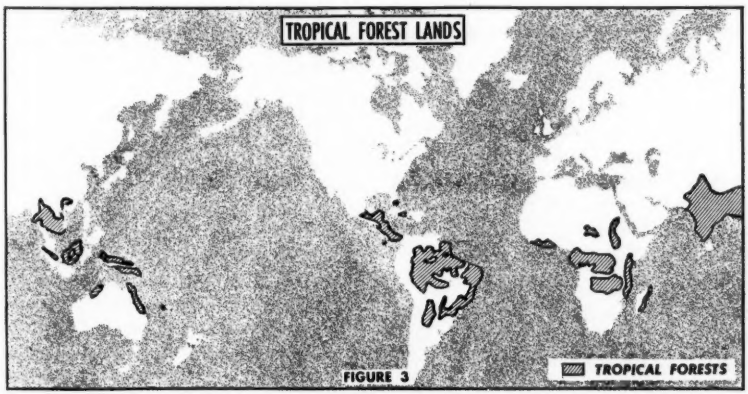


FIGURE 3

There is an excess of moisture. The land is hidden by luxuriant vegetation. Temperatures are nearly uniform. Daily ranges from highest to lowest temperature may be as little as three degrees. Ordinarily the daily range is greater than the annual range. Never as hot as the deserts, nor so cold, these tropical lands cause physical discomfort due to the humidity. Where deserts frequently are subjected to floods, so the tropical forests occasionally suffer from drought.

The tropical forest lands occupy a belt almost 20° wide, on both sides of the equator. On the eastern sides of the con-

tinents they extend poleward an additional 5° or more. There are three chief areas: The Americas, Africa and Asia-Australasia.

The largest single area is the Amazon and parts of the Guianas. Here the forest extends from the Andes eastward to the Atlantic and as far south as Paraguay. This area extends north through the West Indies to southern Florida, Central America and Mexico almost to the mouth of the Rio Grande, all east of the mountain ranges (Figure 3).

In Africa, parts of the Congo basin and the Guinea coast are of this group. The east coast has only a narrow fringe of tropical forest. The lowland areas of the East Indies, many of the islands of the South Pacific, the northern and northeastern fringes of Australia, and the great river valleys of southeast Asia, are tropical forest. Only in India does this area extend north of the 20° latitude. The Dekkan and most of the Ganges valley, are covered by tropical scrub forest, extending beyond 30°N.

The climatic conditions of high temperature and humidity cause rapid weathering of exposed rock. This rapid decomposition causes a rounded appearance of the landforms in contrast to the sharp, rugged features of the dry lands.

Problems encountered during military operations are of two categories: Conquering the climate and fighting the enemy. Most of the difficulties arising from climate evolve from the temperature with its physical discomfort and the humidity. The breeding of swarms of insects in the humid air demands countermeasures for the protection of the individual. Diseases engendered by existence in constantly moist clothing are no less an enemy than the hostile soldier. The closeness of vegetation cover reduces observation and makes movement cross-country a difficult maneuver. Development of anti-rust compounds, and measures to protect cloth and other equipment are not yet satisfactory.

Logistically, waterborne and air transportation are the most efficient and practicable methods of moving and supplying troops in these regions. In 1942 we knew little of the problems of the tropics. Today we recognize the problems and have learned much from our experiences in the South and Southwest Pacific, India and Burma.

Part II of this article will appear in the March issue of the MILITARY REVIEW.

Feb 1949

At the outbreak of an emergency or before it takes place, the Army must be prepared to occupy those areas from which air attacks could be launched against our industrial cities; it must be prepared to give protection against bombing, sabotage and fifth column attacks to the most vital installations, including the Atomic Energy plants; and it must be able to seize the overseas areas of vital importance to our communications and to our Air Force. The units for this job must be in being, up to strength, fully equipped and trained.

General Omar N. Bradley

REPACKAGING REQUIREMENTS OVERSEAS

Lieutenant Colonel John W. Schroder, *Ordnance*
Instructor, Command and General Staff College

REPACKAGING in overseas theaters was one of the most important, least publicized, and most neglected activities of the supply services during World War II. Before getting into a discussion of the subject it might be well to review the definitions of packaging and packing.

"*Packaging*: For military purposes, packaging is considered to include any necessary cleaning, preservation, determination of unit quantities per package, protective wrapping, cushioning, and identification marking up to but not including the shipping container."

"*Packing*: For military purposes, packing is considered to include the selection or construction of the shipping container and assembly of items or packages therein together with any necessary blocking, bracing or cushioning, weather-proofing, exterior strapping and marking of exterior shipping container for identification of content."

That may sound like a lot of words but it will be noted that it establishes a complete description of each operation. However, for the purpose of this discussion the two operations will be considered as one and "packaging" used in its general sense to cover both.

Wartime *vs.* Peacetime Requirements

In peacetime many of the large commercial concerns had the experienced personnel and facilities necessary for a world-wide export business. At first glance it might seem that their experience could furnish an answer to the Army's problem. However, this was not the case, since in some commercial practice shipping conditions were not severe, warehouses and covered storage were always available and trained personnel handled the shipment from beginning to end. Even under those conditions corrosion was often a problem. This problem did not worry the commercial concerns too much since losses were covered by insurance. As a contrast to these conditions, in wartime supplies are handled under the most severe conditions and unloading and handling is often done without proper equipment and with inexperienced labor thereby subjecting the cargo to great damage. The general lack of storage facilities overseas results in supplies being stored in the open for long periods of time subject to the effects of weather. This is particularly bad when there is a wide range of climatic conditions in the theaters of operations, as was the case in the last war.

Experience in World War II proved that the problem of repackaging supplies overseas required trained personnel, organized in teams, and proper materials and equipment, if supplies were to be protected

The requirements for good wartime packaging may be enumerated as follows:

1. The packaging must be strong enough to withstand the rough treatment received in shipping and handling.

2. It must be capable of furnishing adequate resistance to the effects of storage for a minimum of twelve months under severe atmospheric conditions. (According to the Joint Army-Navy specifications, severe atmospheric conditions may be considered to range from 20° to 85° with 95 per cent relative humidity and to 140° with low relative humidity.) Adequate resistance to the effects of intermittent rainfall must also be provided.

3. Packing should be designed to conserve shipping space and to assure maximum utilization of handling equipment, where applicable. As much as 50 per cent of the cubic capacity can be saved on large equipment by partial disassembly and proper boxing.

4. The weight of packages which have to be man-handled must be kept down.

5. Packages which have to be opened for inspection or partial issue should be resealable.

At the outset of World War II, packaging was little more advanced than at the end of World War I. Procurement contracts ordinarily called for no more stringent standards of packaging than those required by domestic common carriers and this was not enough for wartime conditions. Shortly after the war started it became evident that something had to be done to improve the quality of the packaging for overseas shipments and research programs were established. These programs were handicapped by a lack of specific information from overseas theaters as to the nature and cause of packaging failures and by a reluctance on the part of manufacturers and others to establish special packaging procedures. In general, however, considerable advance was made in this field although the results were not felt overseas until near the end of the war. Research is being continued towards developing still more satisfactory packaging methods, particularly in the use of plastics.

The Problem Overseas

One major problem which arose during the war and which was not satisfactorily solved was that of repackaging of supplies in the theaters of operations. The magnitude of this problem is often not fully realized by persons who have not had personal contact with it. Although it might seem that the problem of packaging would not exist on the using end of the supply line, such is not the case. The need for packaging operations overseas arises from several factors, the most important of which are:

1. Breaking down bulk shipments and repackaging in small quantities for shipment to forward units.

2. Repackaging of material repaired in base shops prior to placing it in depot stock.

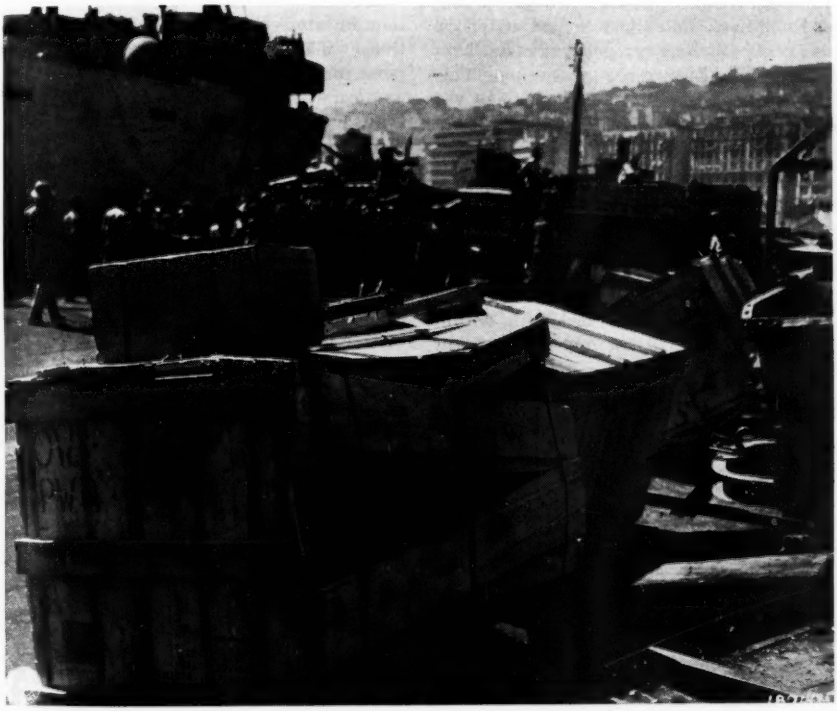
3. The preparation of excess supplies for shipment to the United States or another theater, or for long-term storage.

4. Repackaging of supplies and equipment from packages which have failed.

It is sometimes felt that proper initial packaging would practically eliminate the need for repackaging in the theater; however, a study of the above factors will show that this is not the case. Even though the amount of repackaging required for breaking down bulk shipments can be reduced by proper unit packaging, there is a limit beyond which this becomes uneconomical.

There is no way to eliminate the need for packaging equipment repaired in maintenance shops for return to depot stocks, and this constitutes a large volume of work. Any failure to properly package this shipment results in waste of equipment and effort. A typical example of this was an ordnance shop in England that

was doing an excellent job of overhauling vehicle engines, but boxed the repaired engines and placed them in supply channels without proper preservative care. Approximately 1,200 of the 2,200 that had been repaired were shipped to the continent. Upon reaching maintenance organizations which were to use them, it was found that over 50 per cent were unserviceable due to rust which "froze" the valves, pistons, etc. Upon investigation of the balance of the engines at the base shop it was found that over 50 per cent of these were also unserviceable. Proper provisions for packaging at this base shop would have prevented this. Not only equipment repaired by base shops, but also equipment being shipped to base maintenance shops or temporarily excess or unserviceable, must be protected by proper packaging to prevent deterioration.



An example of the need for repackaging supplies damaged in overseas shipment; a broken container on the docks at Algeria, North Africa, September 1943.—US Army photo.

Supplies which are to be shipped to another theater or to the United States can constitute a major problem. This

equipment, together with that to be prepared for long-term storage, forms an exceptionally large work load when active combat ceases in a given area. The improper packaging of supplies in this category often results in damage to equipment. For example, a large number of weapons carriers returned from overseas and received at the Carteret Sub-Depot of Raritan Arsenal had an estimated 90 per cent of their propeller shafts bent as a result of improper packaging. This problem became particularly acute at the time of redeployment from the European Theater.

The repackaging of supplies and equipment from packages which have failed due to shipping strain or climatic conditions is by no means a minor problem. While it is true that proper initial packaging can do much to reduce the amount of this type work required, no initial packaging within economic limits will entirely eliminate it.

When bases are being closed out, the problem of packaging assumes great proportions as there are often large quantities of supplies on hand which need repackaging in order to stand shipment and in many cases have to be identified prior to packaging. This was often the case in the Pacific where the nature of the warfare resulted in large quantities of supplies being moved from one base to another, oftentimes without being identified at one base prior to being shipped to the next one due to lack of personnel. It was not uncommon to receive supplies which had been on as many as four or five other islands before receipt.

There were three principal factors which handicapped the work of repackaging in overseas theaters. They were:

1. Shortage of trained personnel.
2. Storage of packaging material.
3. Shortage of equipment with which to perform the work.

In the first place there was a lack of trained packaging personnel in the Army and even if they had been available they would probably not have been where needed since the Table of Organization and Equipment did not list packaging personnel. Neither were there cellular type teams available with this background until late in the war. Since few officers had much understanding or appreciation of the problem, there was not even adequate inspection or supervision of packaging operations. The need for specially trained personnel is generally recognized by persons who have had field experience with the problem. A recent survey on this subject obtained replies from 132 officers who had war experience upon which to base a reply as to the need for such personnel. Of these, 125 recommended furnishing the personnel while only seven felt there was not sufficient need for them.

The lack of proper packaging material overseas was as great a handicap as any other in repackaging activities. In some areas even such fundamental materials as lumber and nails were at a premium. It often became necessary to set crews of men to work dismantling old crates, not only for the lumber but to recover the nails. The shortage of packaging material was caused by the shortage of shipping space for transporting it overseas and a failure on the part of personnel all up and down the line to properly plan for the procurement and resupply of this type of material. Every effort was made to obtain the necessary materials locally. For example, in Australia special preserving oils were developed in coordination with the Australian oil companies. Tin containers, fiber containers, crates and like items were also purchased from the Australians. While this was a great help, it also had its bad features. The materials obtained were not always as good as those from the United States. For example, the attempt to have impregnated fiber tubes for ammunition packaging made in Australia never did prove successful even though they had samples of ours to

go by. The ones they made looked about the same but were not as water resistant as those manufactured in the United States. The lumber obtained in Australia was very hard and heavy. Ordnance repacked a lot of 105-mm ammunition in two round crates and the total weight of each pack was about 130 pounds. Of this, forty pounds was the weight of the crate. Toward the end of the war the situation improved a great deal, though it was far from perfect. It is essential that adequate supplies of packaging material be furnished in another war.

The lack of equipment for proper performance of the packaging mission was also a handicap but not as great a one as the lack of personnel and supplies. Improvisation and slower hand methods were used to overcome this handicap, but it would be highly desirable to provide depot and maintenance companies with the necessary hand tools, heating equipment, dip tanks, power saws, etc., required to properly perform their packaging mission.

Manila Operations

When packaging teams became available towards the end of the war, they were utilized to good advantage and did excellent work. A typical example of the use of one of these teams is the operation carried on at the Ordnance General Supply Depot, Manila, in early 1946. The depot had the mission of supplying ordnance items to the Army, Navy and Air Forces in the AFWESPAC area, reception of ordnance material from other bases in the islands and New Guinea which were in the progress of being rolled up, and declaration, segregation, and storage of war surplus. In February a trained packaging team was obtained from the United States, consisting of one officer and nine enlisted men. The arrival of this team satisfied a definite need in the depot. The over-all condition of the depot stocks was extremely poor. Much of the material had been moved successively from base to base through the New Guinea campaign and repacked under field conditions with improper or no preservation applied prior to reboxing. The bulk of the material, regardless of its source, had been exposed to a rainy season in Manila, most of it in open storage, and the prospect was that it would spend another wet season in the open before it could be moved to permanent covered storage, returned to the United States, or otherwise disposed of.

The employment of the packaging team was as follows:

1. A prefabricated warehouse, 88 by 250 feet, was set aside for the work, and housed inspection, reconditioning, box-making, and repackaging sections set up on a production line basis. Two members of the team were assigned to the repackaging section with from fifty to one hundred Japanese POWs. One man was put in charge of the box-making shop with thirty to fifty Filipino carpenters and helpers. The box shop supplied boxes on job order for all other elements of the depot.

2. Four of the men were organized into two sections with Filipino helpers and assigned the mission of inspection of stock in storage and spot repackaging or repair of damaged packages. These sections, on a schedule set up by the Chief of Storage, inspected material in storage and either declared its state of preservation satisfactory, made minor corrections and repairs within their capabilities, or, in the case of advanced deterioration, had the entire lot removed to the shop for processing.

3. The remaining two members of the team were assigned to the Shipping Section where they supervised the packaging line for inter-island and United States shipment.

4. The officer in charge of the team was assigned as assistant to the Chief of Storage with principal duty as supervisor of the team activities.

Conclusions and Recommendations

The advantages of having trained packaging personnel available in overseas theaters are many, the most important of them being:

1. Conservation of parts, supplies and equipment through proper packaging to prevent damage caused by handling and exposure to the elements.

2. Conservation of critically needed shipping and storage space through compact packaging.

3. Best possible use of materials on hand for packaging.

4. Proper marking of packages to facilitate identification, segregation, storage and issue.

The need for trained packaging personnel can be met by the establishment of packaging teams under the Tables of Organization and Equipment of the 500-series, by adding specialists to existing depot and maintenance company Tables of Organization and Equipment, or by a combination of these two methods. The latter will provide the maximum flexibility and at the same time assure the availability of proper personnel at all times. The teams should be small, not exceeding one officer and ten enlisted men, while one or two specialists in company Tables of Organization and Equipment should suffice. This personnel should be of high caliber and well trained so that they can instruct, supervise, and inspect packaging operations throughout the area, not only to assure proper operations, but also to discover the reasons for package failures and develop corrective measures. In order that packaging personnel can perform their job properly, it is essential that packaging materials and equipment be available at all times. To assure the availability of material will require prior planning on the part of the supply services and an awareness of the problem on the part of all persons concerned. Packaging personnel in overseas theaters must be kept fully informed of new developments in the methods and materials of packaging.

In view of the importance of this problem both from an economic and operational standpoint, it is recommended that the technical services take the following action:

1. Establish 500-series teams of packaging experts and add the necessary specialized personnel to existing or new depot and maintenance company Tables of Organization and Equipment. In this connection it should be noted that the Army Packaging Board has indicated its concurrance with the idea of establishing 500-series packaging teams and adding specialized personnel to companies. Some of the technical services are currently studying this proposal.

2. Develop standard basic loads of packaging material and equipment to be carried by maintenance and depot companies.

3. Prepare and maintain current instructions covering field packaging operations.

Despite the destructive possibilities of the atomic bomb and other scientific advances in warfare, wars still are won by ground soldiers who seize and hold the enemy's territory, or successfully defend their own.

General Jacob L. Devers

Defense Along the Abucay Line

Lieutenant Colonel H. K. Johnson, *Infantry*
Instructor, Command and General Staff College

ACCOUNTS of small unit actions during the early phases of World War II should have a definite place in the reading program of the military student. Every day that passes tends to lead us away from the realities of combat and into the realm of the theoretical. This tendency is especially pronounced with relation to the problems that were faced by elements of the United States Army in outlying bases at the outbreak of World War II.

While a desire to study these actions may exist, there are few accounts available in our military libraries to assist the student or the casual reader in pursuing a particular study. Many histories tend to omit the instances of poor performances or failure to accomplish a mission in the mistaken belief that to recall such incidents is a reflection on the unit. Much can be learned from studying and analyzing the reasons for failures. Other lessons can be learned from studying successful actions.

There is much to be learned from a study of the first four months of the war in the Philippine Islands. It is not the purpose of this article to discuss the state of preparedness for war in the Philippines; rather, I propose to take one small unit of the force in the Philippine Islands on 7 December 1941 and examine one action in which that unit participated to determine the lessons that may be of value under similar conditions in the future.

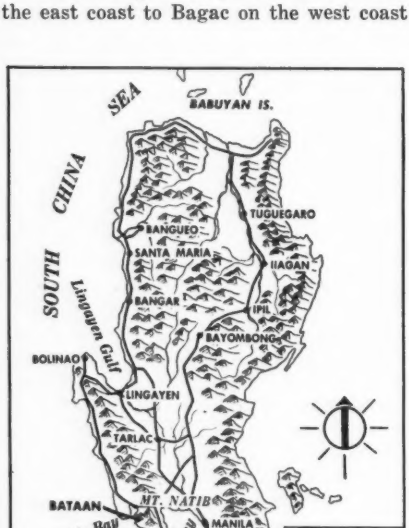
Defense of the Philippines

Until August 1941, the defense of the Philippine Islands in the event of attack was predicated on holding the peninsula of Bataan to deny Manila Bay to the enemy until such time as reinforcements could arrive on the island of Luzon with which to defeat or force the withdrawal of the hostile forces. While lip service was paid to the defense of the beach in the event of attack, primary concern rested with plans for withdrawing the largest possible force into Bataan for the purpose of establishing a defense that could resist any hostile attack. Maximum delay was to be effected during the withdrawal period. Plans were constantly revised in an effort to achieve longer delay and to provide the best defense in Bataan.

The island of Corregidor dominates the entrance to Manila Bay (Map 1). In turn, the southern tip of Bataan dominates Corregidor, so that Bataan must be held to insure the integrity of Corregidor and deny Manila Bay to a hostile naval force. It was contemplated that Bataan would

The Japanese had been relatively unopposed in the Philippines until they struck the Abucay Line on Bataan. The successes and failures of that defense contain valuable lessons for the military student

be held by occupying a series of positions across the entire peninsula (Map 2). The first position was a delaying position in the vicinity of Layac Junction, which was not an integral part of the position defense, but which was deemed suitable for effecting additional delay. Positions farther to the rear were to be held in strength. Early plans—that is, prior to 1940—provided for two positions, one from Orion on the east coast to Bagac on the west coast



of Bataan, and a reserve position farther to the rear pivoting on Mt. Mariveles.

With German successes in Europe in 1940 apparently attributable, in part, to a combination of air power and increased mobility, an effort was made to establish the first line of defense in Bataan as far forward as possible consistent with the size of the force available to man the defenses, in order to permit more dispersion and greater flexibility in the conduct of the defense. Surveys were initiated with a view to establishing a fortified line, but no construction was undertaken. However, the surveys and detailed reconnaissance did result in establishing the initial defensive position on a general east-west line from Mabatang, just north of Abucay, on the east coast, to Moron, on the west coast, and running generally just north of Mt. Natib. Mt. Natib was the dominant terrain feature in the area and its upper slopes were generally accepted as being unassailable to a force of any consequence.

The first lesson can be learned from the casual acceptance of terrain as being impregnable. This view was adopted despite intelligence reviews of the German campaign in Greece, which had definitely established that there are always some means of overcoming any handicaps imposed by terrain. This defensive position was later turned because an inadequate force defended the area in question. It is essential that even greater care be exercised in the future in analyzing terrain in view of the innumerable capabilities of vertical envelopments.

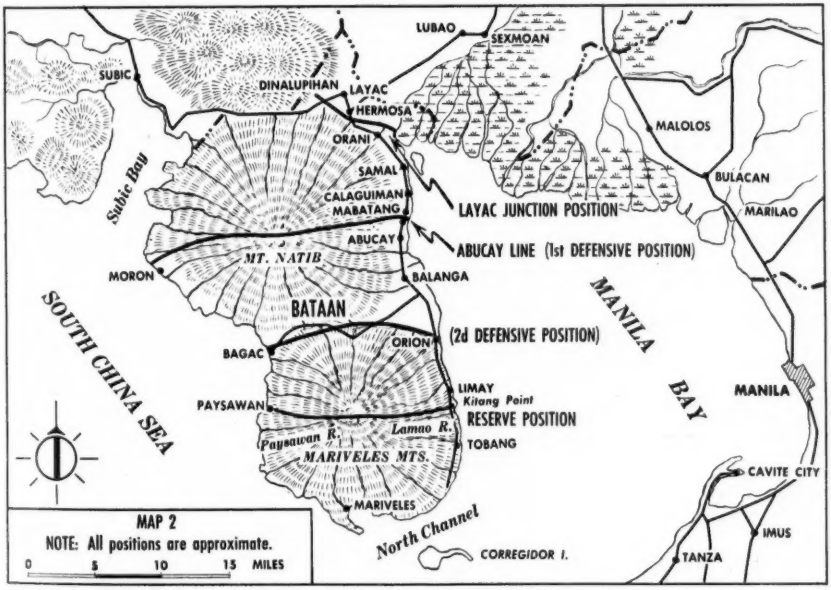
In August 1941, the decision was made to call the Philippine Army into the service of the United States and establish a firm defense of the Philippine Islands. The bulk of both Philippine Army and United States forces was disposed for the defense of Luzon because that island is the center of population and had the greatest importance from both political and economic points of view. With the additional force available, it was deemed feasible to defend on the beaches, and to constitute a powerful reserve to repel any successful landings.

By 7 December 1941, about 70 per cent of the Philippine Army had been mobilized. The training of the units was far from complete and the equipment was neither adequate nor up-to-date. In addition to the Philippine Army units, there were

12,000 Philippine Scouts and about 22,000 United States troops. The regular troops constituted one infantry division at about 60 per cent strength, antiaircraft artillery, two tank battalions, some seacoast artillery, some air force units, and service troops.

57th Infantry (PS)

This account is concerned primarily with one of the infantry regiments of the Philippine Division, the 57th Infantry, Philippine Scouts (PS). For a more complete understanding of the operation it is advisable to examine the organization of the Philippine Division, the only United States division in the islands. At the outbreak of the war, this division, unnumbered, was composed of both United States and Philippine Scout units. All officers were officers of the United States Army, either regular or reserve. Two of the infantry regiments were composed of Philippine Scouts, while the third regiment, the 31st Infantry, was composed entirely of United States soldiers. The three field artillery battalions were composed of Philippine Scouts as were the Medical Battalion, the Engineer Battalion, and the Quartermaster Battalion. The Division Headquarters and Headquarters Company and the Military Police Company had both United States and Philippine Scout soldiers. Two batteries in each artillery battalion were equipped with 75-mm guns, while the third firing battery was equipped with 2.95 inch mountain howitzers. Equipment in the hands of the infantrymen was the same as that in use in the United States at that time.



The 57th Infantry (PS) was organized under a special Table of Organization and Equipment that had been approved for the Philippine Department. The organization of the infantry regiment followed, to a certain extent, current organization

in the United States at that time, although the strength was considerably under that authorized. When the Philippine Army was called into federal service, the Regular Army units of the United States were required to provide training cadres which served to reduce the strength of the Philippine Scout regiments. Approximately 2,300 Philippine Scouts were on duty with the Philippine Army, not all from the Philippine Division. Officer strength was reduced to a greater degree, and at the outbreak of the war there were never more than two officers per company, and usually only one.

A second lesson can be learned from conditions surrounding the training of the Philippine Army. Due to prevailing circumstances at that time, there was probably no alternate solution. However, if the divisions in being are expected to repel initial enemy attacks, it is necessary that they have available those means considered essential for the accomplishment of that mission. Plans must be prepared well in advance for training units without decimating those elements we expect to use in combat in the initial stages of a future conflict. These plans cannot be prepared and filed, but must be kept up-to-date, and the details must reflect current conditions, not a set of assumptions that may or may not be applicable. This point is made because it affected the 57th Infantry (PS) directly.

It should be borne in mind that language difficulties posed a training problem in the days before the war that required the assistance of key noncommissioned officers to solve. With many of the older and better qualified noncommissioned officers on duty with the Philippine Army, the training effort was slowed or retarded to a certain extent. Can we maintain desired standards in existing divisions if we remove a high percentage of key noncommissioned officers? Can we attain the desired standards in newly-activated divisions in the required time without cadres from existing divisions? The same questions apply to combat support and service units. The Philippine Islands showed a glaring need for a suitable answer. Do we have the answer now?

The 57th Infantry (PS) had the best equipment available at that time, with the exception of transportation. However, while the 81-mm and 60-mm mortars were in the hands of troops, there was no ammunition available for either. The 60-mm mortars were abandoned to save space in the limited transportation. Old 3″ mortar ammunition was fired from the 81-mm mortars. In addition to the inaccuracy inherent in this ammunition, gunners were plagued with more than 60 per cent duds. Riflemen were armed with the M1 rifle, but there were no carbines or sub-machine guns. There was one .50 caliber machine gun per battalion. The antitank company had one platoon of three M3 37-mm guns and two platoons of three M1916 37-mm guns each. The antitank armament was actually a blessing in disguise, because there were few hostile tank attacks and then in limited numbers only, while the light 37-mm gun was highly successful against caves and small point targets in the jungle. The regiment had the authorized signal communications of the day, although batteries for SCR 195s were not available in sufficient quantity to effect replacements as required. Transportation was far below that authorized, and was from six to seven years old for the most part, but the addition of busses from nonmilitary sources overcame this handicap and achieved the desired degree of mobility.

The 57th Infantry (PS) had one unit which was peculiar to that regiment alone, and which is worthy of comment. In view of the mission of the Regiment under the pre-war plans, which was to provide the seasoned troops to defend some 11,000 square miles of territory, including twenty-six miles of beach in a probable landing

area, it was felt that the regimental commander should have a reconnaissance agency of some sort. A small reconnaissance detachment within the intelligence platoon was organized to fulfill this requirement. It consisted of three sections of five men each with two vehicles per section. This unit was trained for some six months before the war and upon the outbreak of war could be sent some distance from the Regiment and be depended upon to provide accurate and reliable information of the area to which it had been sent. The unit did not function in combat as it was intended because the regiment did not operate in an area large enough to utilize the maximum capabilities of the section.

The Abucay Line

At the time of the occupation of the Abucay Line, the position had been partially organized by the 31st Infantry Regiment (US). The 41st Division (PA) was on the left of the 57th Infantry (PS), and the 51st Division (PA) was on the left of the 41st Division (PA). The 41st Division was a complete division and had had no contact with the enemy up to the time of its occupation of the Abucay Line. The 51st Division had not been completely mobilized at the outbreak of the war, and, in addition, had suffered losses during the first month of the war which resulted in only a remnant of the initial force reaching Bataan. The 41st Division occupied about normal frontages for the defense. The 51st Division was disposed as a security force on the flank, rather than as a defensive force. Reconnaissance a year earlier indicated that the region of Mt. Natib was so rugged that no enemy could launch an attack in any force, so it was not felt necessary to assume what we think of as a normal defensive position.

The terrain in the sector of the 57th Infantry (PS) was almost bare of cover, and slightly rolling. On the right, or Manila Bay, side of the main road in Bataan, the area was covered with fish ponds divided by high dikes. Gates controlled the flow of water into the fish ponds from the Bay with the rise and fall of the tide. Fox holes were necessarily dug in the dikes. There was no place for the men to relax out of their holes, and there was no rest in the holes. Just west of the road, before the ground began its gradual rise, fox holes had to be very shallow or the water came into them at high tide, not over the top, but as a result of a high water table. To offset the disadvantage of these fish ponds, there were advantages from the point of view of establishing a defensive position. Fields of fire were excellent. Tanks could not approach or operate in the area except over one road, which had numerous bridges that could be blown easily and replaced only with difficulty.

West of the main road, a thin line of trees marked the trace of the main line of resistance. Fields of fire to the front were good, except on the extreme left where a canefield came within four hundred yards of the front. There were shallow draws, both in front and behind the main line of resistance, which were suitable for lateral movement of dismounted troops. The sector of the 41st Division on the left was heavily wooded, and as the ground rose toward Mt. Natib, it became more rugged and the dense jungle growth was an obstacle to both the attacker and the defender.

In defending its sector, the 57th Infantry (PS) was not only responsible for its front, but for the flank resting on Manila Bay. This flank was not secure, because there appeared to be a grave hazard in the capability of the Japanese to organize a fleet of small boats and land relatively unopposed to the rear, or, with some opposition, directly on the flanks. This fleet could be launched either from the vicinity of Manila across the bay, or from the upper reaches of the bay from the vicinity of Sexmoan or Lubao.

Organization of the Position

During the period 31 December 1941 to 7 January 1942, work on the position progressed under cover of troops on the Layac Junction position in the vicinity of Dinalupihan. There were occasional flights of hostile aircraft, but no attacks were made on the ground troops in the area. In occupying the position, two battalions were placed on the main line of resistance, the 1st Battalion on the right with responsibility for the main road, and the 3d Battalion on the left. The 2d Battalion was charged with organization of the regimental reserve line and security of the open flank. However, the 2d Battalion was detached from the Regiment for the purpose of furnishing half of a special task force to occupy the Layac Junction position pending the withdrawal of elements of the 45th Infantry (PS), who were covering the passes leading through the Zambales Mountains to the west. While the 2d Battalion never gained contact with the enemy in the course of fulfilling this mission, the uncertainty of their position, together with the accompanying mental hazard, took their toll, and as a result this battalion was not as fresh as it might have been when it returned to regimental control on 6 January 1942.

Selected parts of the front were wired in within the availability of wire. It was necessary to use wooden posts as there were no pickets. Some substitutes for mines were laid, consisting of cases of TNT, designed as antitank mine fields. It developed that these mines were as effective against personnel and animals as they were against tanks. Carabao, the beast of burden of the East, constantly wandered into the mined area and many of them were blown up.

Some wire was used on the regimental reserve line. When the reserve battalion was available, it did not occupy positions on the line, but was held for use as a counterattack force against either hostile penetrations or beach landings.

On 7 January 1942 the Layac Junction position was overrun. The withdrawal was so rapid that all contact with the enemy was lost. The reconnaissance section was utilized, on foot, to re-establish contact, which was done the following day. At the same time, G Company was used to establish an outpost line.

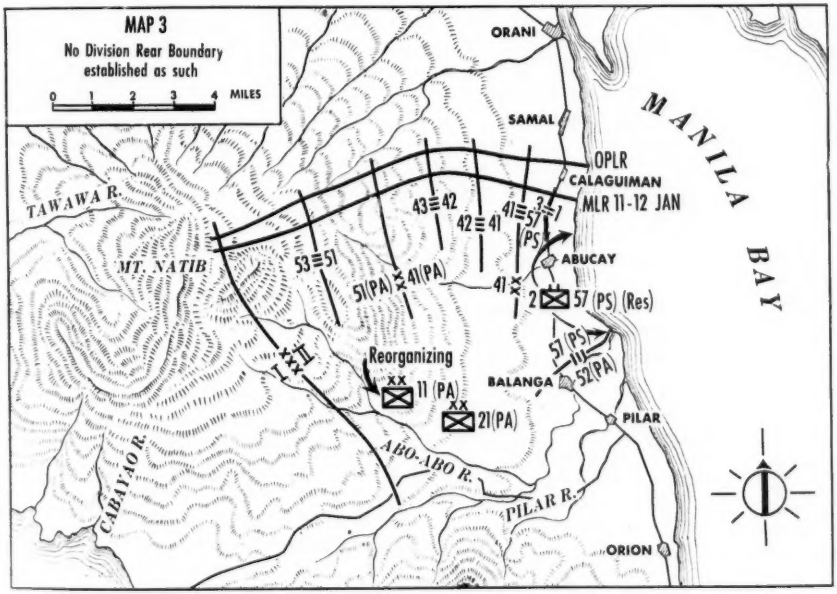
Defects of the Defense

Two outstanding defects in the defense became apparent at this time. First, there was no contact between units on the OPLR. While the outpost established in front of the 57th Infantry (PS) was on a clearly marked terrain feature, Calaguiman River, (Map 3) there was no contact with the unit on the left. In retrospect, this can probably be attributed to a failure to inspect on both the part of battalion and regiment and to the late date at which the outpost was established. The second defect resulted from a failure to effect and check coordination between the 3d Battalion, 57th Infantry (PS), on the left, and the right unit of the 41st Division. This defect was corrected before there were any adverse effects on the defense. The first defect was not corrected. Either there was a tendency to bunch on the part of the outpost force, which is inherent to troops committed to their first engagement, or the outposts of adjacent units were never established on the same general line. *Troop dispositions must be physically inspected on the ground.*

An interesting action, and an effective one, took place with the withdrawal of the outpost. The only communication with the outpost was by SCR 131, a cumbersome radio set that required three men to carry. There was insufficient wire to establish wire communication, and the SCR 195 did not have the necessary range. Calaguiman River runs through a small barrio (village) which lays astride the stream. That part of the barrio north of the stream

had been burned prior to the time that contact with the enemy had been established. As the enemy ran into fire from the outpost, they did not attempt to force a crossing of the stream. However, a sizeable force did close on the stream. Early on the morning of 11 January a messenger reported that the commander of the outpost felt that he should withdraw, if it was expected that any part of his force was to be saved. The messenger also volunteered to fire the remainder of the barrio, south of the creek, to cover the withdrawal of the outpost. He also suggested that the enemy concentration would be a remunerative target for as much artillery as was available. A plan was prepared to set fire to the barrio as the troops withdrew to the beach and made their way back to their own lines. Five minutes after the first smoke appeared all of the artillery in the sector was to sweep the target area. This plan was carried out and patrols later reported numerous casualties, probably not equal to the number reported in the press, but a satisfying number.

Up to this time (11 January) the Japanese had been relatively unopposed in their advance. Unseasoned troops could not be compelled to stand and offer resistance during the long withdrawal from the beaches on Lingayen Gulf and from the sector of the South Luzon Force. There had been occasional fights, but none of sufficient duration to impede the hostile advance. There was little room for further retreat in Bataan. It was either hold on the Abucay Line or capitulate. Stories of the brutality of the enemy had preceded them. While announcements had been made that the Japanese would abide by the terms of the Geneva Convention, although not signatories, little credence was placed



in the integrity of the nation making the announcement. It was now up to the one old unit, the Philippine Division, and more specifically, to the 57th Infantry(PS).

Enemy Strikes the Line

On the night of 11-12 January the enemy struck the main line of resistance of the 57th Infantry (PS) for the first time (Map 3). During daylight hours on the 11th, he had attempted to advance through the fish pond area, but his movements could be observed from the steeple of a church in Abucay which served as an infantry CP and an artillery OP. The attack was dispersed before it came within rifle range. The attacking force slid to the west and struck during the early morning hours. At the time, this appeared to be a reconnaissance party, but when casualties were totaled the following day for the company that had been hit in force it was decided that it was a reconnaissance in force at the very least. There were numerous enemy casualties. The point of entrance to the defensive position was through the canefield previously mentioned as not having been cut down. During this attack, artillery fire was withheld for too long. The 3d Battalion had requested such fire, but the request was denied at regiment. That may appear to be a strange state of affairs, but it should be remembered that every effort was being made to avoid panic. However, withholding artillery support was a grave error. As it became apparent that the canefield was the assembly point from which the attacks were launched, every effort was made to reduce the cover it afforded. White phosphorus was fired without appreciable effect, and later gasoline was used without effect. The cane should have been cut down while the position was being prepared for defense.

Some reorganization was effected during the daylight hours of the 12th. Shortly before midnight that same night, the enemy struck again. This time all of the artillery at hand was employed. This was not much in numbers of pieces, but almost continuous support was given during the night. One battalion of artillery was in direct support, and a two-battery battalion reinforced the fires of the direct-support battalion. 155-mm guns were in general support, but they were not employed to lay down normal barrages. Tons of ammunition were poured into the canefield. The position of I Company of the 3d Battalion was precarious in the hours before daylight. The Battalion launched a counterattack with L Company (in reserve) an hour before daylight, without effect. E Company of the regimental reserve was released to the battalion commander of the 3d Battalion at about daylight. This company was within two hundred yards of restoring the main line of resistance when its advance was halted and it was pinned to the ground by fire.

At this stage of the defense, it would be well to examine this particular employment of the force. As a general rule, our service schools are opposed to the piecemeal employment of the reserve. It would appear that this teaching had been violated here. However, on the ground, there are certain conditions that are rarely, if ever, found in the text books. In practice, there is usually some support available to the rear, especially in the early stages of the battle. In this case, two Philippine Army divisions, or what was left of them, were being rehabilitated, but were in no condition to enter combat for some time. Beyond them, there was nothing of a defensive nature to the southern tip of Bataan. In employing the reserve in piecemeal fashion, it was felt that the balance of that force could occupy the regimental reserve line and hold the enemy for another day to permit bringing up units that were employed on the west coast. The defense would be a shell, but some delay could be effected. Delay was not the solution; an impenetrable de-

fense was. By utilizing E Company to stem the advance of the enemy, it was felt that the balance of the 2d Battalion could occupy the reserve position and hold the reduced impetus of the attack. As it developed, this line of reasoning was sound, probably because the enemy failed to exploit his success immediately. How successful a battalion counterattack would have been in restoring the original battle position is a matter of question. The 3d Battalion occupying the sector originally was completely and hopelessly mixed up. All of the officers and key noncommissioned officers of I Company were casualties. L Company had become lost in the dark and intermingled with K Company on the main line of resistance in the battalion sector. E Company from the regimental reserve was able to block the breach in the line, although it was unable to restore the position.

II Corps was responsible for the defense of the eastern sector of Bataan. During the course of the day of 13 January, II Corps observers were constantly present in the sector of the 57th Infantry (PS). During the late afternoon, two Philippine Army battalions were attached to the regiment for employment in the sector. It was planned to hold one Philippine Army battalion in reserve, concentrate the 2d Battalion, 57th Infantry (PS) behind the breach in the line, and relieve K Company from the line with the second Philippine Army battalion. Both Philippine Army battalions arrived in the reserve position. K Company, on the main line of resistance, tired of waiting for replacements, pulled out, leaving the entire 3d Battalion sector open. The enemy did not take advantage of this lapse. There was time to shift the battalion in reserve initially, the 2d Battalion, 57th Infantry (PS), so that the nose of the salient was blocked, and close in the remainder of the salient by refusing the flanks of the units on the side. At the same time, plans were drawn for a counterattack at daylight the following morning with one of the two Philippine Army battalions. Tanks were requested but were not obtained. The artillery planned and fired a rolling barrage with the bulk of the available artillery. The attack was launched shortly after daybreak with troops that had been taught no offensive tactics and had never participated in an offensive maneuver. The troops stood up behind the barrage and walked on to the designated objective. About four hundred yards of the original front were still open, but two companies now held the nose of this re-entrant. Encouraged by the success of the first counterattack, the second Philippine Army battalion was directed against the nose of the salient, in a frontal attack. This attack met with limited success, but failed to attain the objective. Further attacks were without success. A regiment of the 21st Division (PA) was released to the 57th Infantry (PS) for employment, and attacks directly against the nose of the enemy salient were launched. Progress was slow, but by 19 January the line was completely restored.

What had originally been held with three understrength battalions of infantry was now held with eight battalions (still understrength). A regrouping was effected during the course of the next four days, eventually releasing all of the 57th Infantry for employment as a counterattack force in its own sector or for employment in some more critical sector. No more attacks were launched against the front of the 57th Infantry (PS) or the attached units. While the defense was not all that could have been desired, the line had held and the Japanese had been stopped for the first time.

Participation of the 57th Infantry (PS) in this particular engagement was now at an end. The regiment did direct and supervise the withdrawal of attached units, but that was an action in itself. To complete the picture on the Abucay Line, the

enemy continued his sliding tactics until he found the lightly held sector on Mt. Natib. As he built up his force in this area, both the 45th Infantry (PS) and the 31st Infantry (US), the other two infantry regiments of the Philippine Division, were committed piecemeal, but were unable to completely block the enemy advance. Small patrols continued to infiltrate farther to the rear and build up so that it was necessary to withdraw before the position was completely turned, and the defensive force cut off. The Abucay Line was held from 7 to 23 January 1942. The position paid tremendous dividends in that an additional enemy build-up was required before the final attack was launched the first part of April 1942.

Lessons

Several lessons can be learned from this engagement. One lesson stands out from the point of view of the attacking force. *Be prepared to exploit every success.* Had the Japanese exploited their initial success at Abucay, Bataan would have been overrun not later than the end of January and probably much sooner.

From the point of view of the defender, particularly the 57th Infantry (PS), there are other lessons. First, there were insufficient inspections. Thus the failure of one battalion commander to clear fields of fire was not discovered in time to have corrective action taken. There were no command or staff efforts to coordinate adjacent units on the outpost line of resistance. This enabled the enemy to build up in front of the main battle position by infiltration through the gaps in the OPLR and launch an attack earlier than he should have been able to. Since every effort was directed toward gaining time, this was a serious defect. Second, there was too much dependence placed on the impenetrability of the terrain. Terrain alone will not defend a sector adequately. Third, the question of weakening trained fighting units during the critical period inherent in the early stages of a war to provide cadres for new units should be carefully examined. Some other source for cadres must be developed. Fourth, the strength of the Regiment was dissipated by taking away one battalion and incorporating it in a special task force. Such practice appears to be unsound, because it weakened an integrated fighting unit with the result that its best efforts as a fighting team could not be utilized to maximum capability. While the lack of trained units might well have prompted such use of tactical units, it appears, however, to be particularly desirable that in the absence of trained units, the strongest unit available should be employed intact in the decisive direction and at the decisive time. Finally, the decision to employ units piecemeal must be the result of complete and careful analysis. In some instances, such a decision may be justified, but all the risks involved in such employment must be carefully calculated by the commander making the decision.

We must have the capability of immediate and effective action at the outset of war. There is a growing opinion that if another war should occur the initial stage of combat will be decisive.

General Hoyt S. Vandenberg

Medical Research and Development Program

Colonel Don Longfellow, *Medical Corps*
Office of The Surgeon General

SINCE the beginning of World War II, medical research has made tremendous strides, a great many of which have been made possible by the financial support of the Armed Forces. It is regrettable that it takes an emergency such as war to stimulate such work, but such is the case, and under such circumstances many of our greatest scientific accomplishments have been achieved.

Until World War II, medical research was not recognized by the Armed Forces as a distinct function of their Medical Departments. In addition, this type of work was restricted to a great extent because of the inadequacy of appropriated funds. Prompted by the urgency of the recent conflict, substantial funds were allocated for Medical Research and Development, and the government became a leading underwriter of research. Scientists in civilian institutions, as well as in the Armed Forces, accepted and carried out a controlled and directed program of medical research with specific objectives as a goal.

With the war over and military strength decreased, it is believed that now, more than ever, funds for research and development should be increased, and we are doing all within our power toward accomplishment of this objective. We are well aware of our responsibility in providing financial assistance and incentive for basic research and are diverting a major portion of our research funds to these projects. Research in the basic sciences, as well as in the fields of medicine and surgery proper, are being stressed, and we are cooperating fully with civilian institutions.

In addition to the normal problems which are encountered in civilian and military medicine, generally, there are problems peculiar to the Army itself for which we, of necessity, must produce answers. During the war, all research was done under pressure, due to the urgency of the situation. Great strides were made, particularly in certain fields. Drugs such as DDT were developed to combat disease-bearing animals and insects. Penicillin and streptomycin were developed at an unheard-of speed, made necessary by the war. Great strides also were made in the field of blood substitutes and derivates; i.e., use of plasma and human serum albumin in the treatment of shock. Now, however, science has returned to the more leisurely pursuit of knowledge in

Under the impetus of World War II, great strides were made in the field of medical research. Now, with that urgency passed, the Medical Department of the Army continues with an important research program

medical research, and we are stimulating our own research facilities and those in civilian institutions to produce answers to problems of civilian and military interest.

Our present research and development program is based on manpower losses during World War II and on the expected manpower losses that can reasonably be anticipated in a future war. Manpower losses in the past war consisted of approximately one-third for battle casualties and two-thirds due to sickness and injury. One out of every ten men was unavailable for tactical or other military employment, because of being either a patient or being required for patient care.

In a future war, with wide-scale use of atomic warfare and other weapons yet to be developed, it is possible that, unless improvements are made, the proportion of sick and injured and those necessary to care for them will be increased. To improve our present medical service, it is essential that we not only improve our general standards of preventive medicine and patient care, but we must also specifically solve medical problems peculiar to the Armed Forces during war.

The Medical Department of the Army has several sources of research facilities. The first of these are our own Medical Research Installations. These are the Medical Department Field Research Laboratory at Fort Knox; the Medical Nutrition Laboratory at Chicago, Illinois; the Tuberculosis Nutrition and Metabolic Unit at Fitzsimons General Hospital, Denver, Colorado; the Traumatic Surgery Unit at Brooke General Hospital, Fort Sam Houston, Texas; the Army Medical Department Research and Graduate School, Army Medical Center, Washington, D.C.; the Engineering Development Division of the Army-Navy Medical Procurement Office, New York; the Ocular Injury Research Unit, Army Medical Center; the Surgical Brace Research Unit, Army Medical Center; and the Army Prosthetics Research Laboratory, Army Medical Center.

The second source is the research units of other services working on a cooperative basis; the third, the research units of other Federal Services (Veterans Administration, Public Health Service, and Department of Agriculture); and the fourth, and final, source is contractual agreements with civilian institutions. To prevent duplication within the Service, all work is coordinated through the Research and Development Board. Coordination with the civilian work in this field is gained through the Division of Medical Sciences, National Research Council.

There have been many important advances in the field of medical research. One of the most fertile fields of investigation has been in the development of new prosthetic devices for amputees. This work has been carried out at the Army Prosthetic Research Center, Army Medical Center, and has produced some of the finest work of its kind in the United States. The best artificial hand so far found was developed there. It is made of lightweight metals, about 90 per cent aluminum, and the amputee can deliver about thirty pounds of pressure at the finger tips, which is about the same amount exerted by a person without any handicap; however, an amputee has the added advantage of being able to maintain this pressure for an indefinite period of time while the non-handicapped person can only maintain this pressure for eight to ten seconds.

The hand is well liked by the amputees and a cosmetic glove used as a covering for this hand has also been developed. This glove is of pliable plastic material which is made over a mold of an actual human hand and is complete with vein markings and hair. This combination has resulted in a functional hand which so nearly resembles the normal hand that it is difficult to tell which hand of a unilateral amputee is artificial except upon the closest examination.

Two other hands have been developed, and are now being used both in the Serv-

ices and the Veterans Administration. It is expected that the cost of these hands will be much lower than those on the market at the present time. A new type of hook for use by amputees has also been developed, and it is preferred by most amputees who are using it to any other type available today. Constant research in this field is continuing, and many improvements to other existing prosthetic devices are being developed.

Another development of note has been in the field of surgical braces. This work has also been conducted at the Army Medical Center. An entirely different type of prefabricated brace has been developed of aluminum, thus reducing the weight of the brace and also reducing the amount of time necessary to fabricate a brace. These braces have the added advantage of the use of replacement parts thus reducing the cost, since in the past it was necessary to construct an entirely new brace when one part was broken. Another cost-saving item in this type of brace is the fact that when the brace is discarded the parts which are undamaged can be used again.

In the field of actual medical research, we have been extremely fortunate in the field of antibiotics. The uses of streptomycin have been expanded particularly in the field of tuberculosis, where this drug has proved to be very useful particulary in the early stages as it is found in the Army during the course of routine physical examinations. Its use in other fields of medicine and surgery are being expanded every day through our hospitals and research facilities.

Another new antibiotic, chloromycetin, has been developed under Army supervision and has been tested in Malaya as a means of treatment of scrub typhus fever and typhoid fever. The reports which have been coming back from Malaya have been very encouraging. The use of this drug has proved to be specific in the case of typhus fever, a heretofore unheard of treatment. This is of utmost importance in the prevention of epidemics of typhus fever. The drug has also proved to be a curative agent for typhoid fever which previously has also been treated symptomatically, and although the number of cases so far treated are small it appears to be the best known method of treatment today. A new antimalarial drug, chloroguanidine, has been developed which is far superior to atabrine in the prevention of malaria.

A field of medical research which is of primary value at this time is that of radiation injury. Research in the medical aspects of this type of injury is basic in character since we are working in an entirely new field. Continuous research in this field is indicated at all costs, since we must be able to treat this type of injury should the occasion arise. We are conducting basic work in this field both in our own installations and in civilian institutions. So far we have found one drug which shows promise in preventing this type of injury if it is given prior to the injury. This field is being investigated to the greatest possible degree so that a method of prophylaxis against this type of injury can be developed.

Advances also have been made in the field of epidemiology. New strains of the virus which causes influenza have been isolated and are now being incorporated into vaccines which are now undergoing tests. It is hoped that with these new vaccines we will be able to prevent many cases of influenza which are a large cause of man-hour loss. Another new vaccine which has been developed through the Army Epidemiological Board investigations is the vaccine against Japanese B Encephalitis. This has been used during the past three years in the Far Eastern Command with constant refinement of the vaccine. So far as can be determined, the vaccine is of great prophylactic value in the prevention of this disease.

Military Ethics

Major (Chaplain) A. C. Longley
Instructor, Command and General Staff College

Introduction

LEADING troops in battle calls for cool and thoughtful leaders inculcated with a strong feeling of the great responsibility placed upon them. Troops are strongly influenced by the personal conduct and example of their leaders. In addition, leaders are continually forced to make decisions which not only affect the moral values of those they command, but which may also deprive the soldier of his most cherished possession, his life. The leader must be certain that such decisions, and the methods used to carry them out, are moral and justified.

The term "ethics" is borrowed from the Greek. Taken in a wide sense, it means customs or practices, the more or less fixed pattern of behavior observable in the deliberate acts of human beings. Hence, ethics is specifically that science which examines conscious and deliberate human actions to discover why some are evil, others good. In brief, ethics studies morality.

Ethics can be fitted into the study of leadership this way: Consider the *personality* of the American military leader. Personality embraces all of the leader's traits: Moral, intellectual, and physical. Physical traits include physique, stamina, energy. Intellectual traits involve the leader's professional and general knowledge. Moral traits are summed up by the one word *character*. Ethics studies the leader's moral personality or character and assists him in developing a code of conduct which reflects the highest traditions of the service.

The officer corps of the United States Army is pre-eminently a closely knit society because of its common interest in the military profession. The high ideals and ethical code inculcated in the corps are strengthened and perpetuated through tradition. Senior military leaders have a tremendous responsibility for the proper interpretation of the officer's ethical code and its inculcation into newly joined members of the corps. This ethical code, or concept of moral values, is reflected in the leadership influence of the officer on his men. The capable leader must give equal attention to the stimulation, preservation and enhancing of the morals of the men placed under his care by the nation. The degree of success attained will be instrumental in affecting the entire nation long after the soldiers have returned to civilian life.

The Army defends right, avenges wrong at home and abroad. To discharge this duty is the first responsibility of the commander. In his oath of office, an army officer solemnly swears that he "will support and defend the Constitution of the United States against all enemies, foreign or domestic, that (he) will bear true faith and allegiance to the same . . . that (he) will well and faithfully discharge the duties of the office upon which (he) is about to enter." He concludes his oath with the invocation "So help me God."

Furthermore, the commission which he receives from the President charges him as follows: ". . . reposing special trust and confidence in the patriotism, valor, fidelity, of * * * I . . . appoint him . . . in the . . . Army of the United States . . . He is therefore carefully and diligently to discharge the duties of the office to which he is appointed . . . And I (the President) do strictly charge and require all officers and soldiers under his command to be obedient to his order . . ."

Both as a science and as an art, ethics rests heavily on religion. A commander's religion, whether it be formal or natural—that is, whether it be Judaism, Catholicism, Protestantism, or a well-conceived philosophy of life—provides him with certain definite convictions which lay the groundwork of his ethical code. Summarized, these are:

God exists.—Without a God to Whom man is responsible for his actions, there is no valid reason for a moral code other than mere expediency or convenience. Without God, there is no adequate explanation for universal order, of which the moral law is one aspect, the laws of nature another. The political philosophy of the United States is based on the premise of God's existence and providence.

Man has an intellect and a free will. His moral actions are not ultimately determined by his environment. Intellect and will are the prime factors of moral conduct.

Law is necessary both to God and man. To create is not to bring things into being capriciously. The act of creation is deliberate and purposeful. Therefore, man as part of the Creator's organized plan must conform his actions to the pattern of the universe. Though by nature free as to will, man is by nature limited in intelligence and ability. Without law as a guide for action, he would run the risk of becoming a victim of his own ignorance, and so of failing to achieve the very purpose of his existence. Law is the criterion of right and wrong. Actions which conform to the law are *good*; those which are at variance, *wrong*.

The Moral Faculties of Human Nature

The study of ethics begins with man, the "observer" of the moral law. Before introducing the concept of law and its application to acts, it is well to consider the moral attributes possessed by man himself. These are the tools which he uses to apply the law to his actions. These tools embrace the *moral faculties* which are rooted in human nature. These are the *moral habits, conscience and will*, and the *moral powers* which the law vests in human nature.

The study of ethics gives the military leader a clearer insight into the problems of personality and character, and helps him develop a code of conduct reflecting the highest traditions of the service

Actions frequently repeated, establish behavior patterns or habits. Ethically, these habits can be classified as *virtues* or *vices*, depending upon whether they are related to good or bad actions. Virtues and vices are simply good or bad habits, operative habits, which associate themselves with man's powers of acting. They make actions easier and more pleasant. Since virtues facilitate *good* acts, their value is seen to be of the greatest. In his treatise on ethics, the philosopher Aristotle classified and defined four principal, or cardinal, virtues.

Justice

This is the habit which makes it easy

for the possessor to vindicate his own and to respect others' rights. It prompts him to discharge carefully all of the obligations of his state in life. When one recalls the purpose of the Army, and the countless duties of its officers, the importance of justice becomes clear.

Prudence

The characteristic quality of such a prudent person is tact. If this is so, then his tact is the result of a retentive memory, a quick understanding of what is morally right, a readiness to seek and take advice, and foresight. From this it is easy to see that prudence is as essential virtue of the really successful officer. His whole life is a campaign that must be planned with prudence.

Fortitude

This virtue is a habit which strengthens the will to grapple with difficulties, to face dangerous situations and to sustain onerous burdens in defense of a good cause. Fortitude is courage. The whole training of a soldier is aimed at the development of this virtue; it is absolutely essential on the battlefield.

Temperance

Temperance implies restraint in all things: Eating, drinking, recreation, and work. Temperance may be called the balance wheel of man's moral life. It, too, is a necessary quality for the military man, for temperance promotes a life of moderation, so essential to efficiency and health.

Habits (virtues or vices) make it easy for a man to act. Conscience, prompted by the virtues and the moral powers subjectively, and after considering the objective moral law, decides on the right course of action to follow. Conscience is the name given to the intellect when it assists the will to do or not to do a given action. Conscience acts on the general premise that good is to be done and evil avoided. Then it applies this norm to the action at hand: This act is good, therefore it should be performed, or the act is evil and should be avoided.

If the will rejects the primary judgment of conscience, it then usually moves the intellect to find reasons why the evil act should be done or the good one omitted. The intellect complies, but still tells the will that the act is wrong. The intellect now becomes a shyster on the one hand; but in its role as conscience, it continues to act as a prosecutor. The false rationalization which the intellect does at the behest of the will is the beginning of dishonesty and immorality. The accompanying protests of conscience are often the basis of the inward conflicts which lead to emotional unbalance.

Rights and Duties

Rights and *duties* are the moral powers. They go hand in hand. One is impossible without the other. The commander is constantly aware of the multitude of rights and duties with which his commission invests him.

The term *right* is defined as a moral power which law vests in a person or society. The holder of this moral power may claim something as due to him or as belonging to him. A right may empower its possessor to demand of others that they perform certain acts or abstain from them. This power is moral because it does not depend on might or physical force. Therefore, it is evident that might does not make right.

The correlative of *right* is *duty*. Duties are moral obligations. If an officer is given command of a unit, that appointment gives him certain exclusive rights over the unit, but it also imposes certain moral obligations—duties. These moral obligations arising from law, and by which men are *bound* to *do* or refrain from *doing*, are termed duties.

Moral Law

All law is the "ordering" of conduct

for the common good, promulgated by those who have responsibility for society. Moral law is based on eternal, natural and positive laws. The interdependence among the three kinds of laws is so great that what follows describes not a division of laws, but rather what may be called the "hierarchy of laws." Traditionally, the members of the hierarchy of laws are described in this manner:

The *Eternal Law* is the mind of God directing all things to their final end.

The *Natural Law* is the Eternal Law as man, by the use of his reason, discovers it in himself and in the ordered harmony of the universe, and applies it to his own conduct.

Positive Law embraces the detailed written applications of the *Natural Law.* Positive Law includes the regulations which govern all forms of society. The Ten Commandments, Civil Law, International Law, and Army Regulations are phases of the Positive Law. However, those which have a moral import must be written within the norms of the natural law. Otherwise, written moral laws are unjust and do damage to society. Since the written regulations which govern military life are positive laws, it is necessary that those who are responsible for the military society set their legislation within the framework of the Natural Law. This science gives to commanders the principles upon which their regulations must be based.

It is important to bear in mind that the moral law is strictly objective, never subjective. True, man learns it by using his reason, but it exists apart from him. Nor is it something that man invents to fit the time or his convenience. The existence of this objective law can be proved, then, by considering its reasonableness and the effects of its denial. Experience proves that when the moral law is denied by individuals, unhappiness results; when masses ignore it, chaos follows. This happens even when those who disregard the law do so in ignorance. For example, what happens when the criterion of *truth* is considered as something subjective, or based on expediency? Then men will call things true that suit their purposes, even though the objective facts are the opposite. The consequences of such a false philosophy are only too apparent in the world today. The unreasonableness of this attitude is all but self-evident. Common sense demands an immutable, objective moral law of truth! The same argument can be applied to all of the tenets of the natural moral law.

Not only the laws of nations, but above all international law, must conform to the natural law. The community of nations must observe it, if civilization is to survive.

Application of Law to Actions

Simply stated, the application of law to human conduct involves three steps:

First, man, seeking guidance for his intellect (conscience) so that he can *know* the right course of action to follow, looks to the law. Normally, he seeks the positive law; that lacking, he must interpret the natural law.

Secondly, he applies the law both to the end he wishes to achieve and to the means he proposes to use in gaining that objective. He checks to make sure that his objective is good, and that his means are non-evil.

Finally, his moral habits and powers, especially justice and his sense of duty prompt his will to accept or reject the proposition as good or evil. The accompanying chart graphically describes this process.

As stated above, the morality of an act is determined by two elements: The *immediate objective* to be achieved, and the *means* used to effect this objective or result. The objective must be good, or at least not evil. So must be the means.

If either is evil, the whole act is vitiated by the evil element and becomes entirely wrong (see chart, items one, two, three, and four). However, many actions which man performs have several effects—those which are *directly* intended, and others which are only *indirectly* intended. If all of the effects of one's action are good or bad there is no problem, the act is either right or wrong. However, what of the case in which the direct effect is *good*, but the indirect effects are or may be *evil*? In such instances, the principle of the "multiple effect" or "indirect voluntary" comes into play (see chart, item five). This principle justifies the performance of such an act provided that the following conditions are fulfilled:

The action done is not evil in itself.

The agent's intention is *morally* right, that is, the bad indirect effects are foreseen but not willed or intended.

The agent derives no voluntary pleasure from the evil indirect effects of his act.

The normal or direct result of one's action is good, and the evil results are only indirect.

The agent has a sufficiently grave reason to perform the act which results in evil indirect effects.

The principle of the indirect voluntary is of importance to the officer because it justifies many of his command decisions, especially in combat. For example, a commander orders a division to take a particularly difficult but highly necessary objective, even though he knows that the effort will cost many lives. Is he morally justified in issuing such an order? Decisions like this have to be made many times in combat. The rule of the multiple effect clearly gives moral approval to such an action. The conditions required by the principle are obviously verified: The commander's action, the issue of an attack order, is not evil in itself. His intention is good. He wishes to take the objective, though he does not will the death of his men, least of all does he derive any pleasure from the thought of their destruction. Furthermore, the direct result intended by his command, the seizing of the objective, is a good result; the evil, the death of some of the attackers, is an indirect effect of the order. Finally, the successful progress of the war makes the taking of this objective of vital necessity.

"*The end justifies the means.*" This norm of conduct is often confused with the principle of the multiple effect. It is, however, essentially different from the latter in that it allows an evil "means-action" to achieve a good end, whereas the principle of the multiple effect always forbids an evil act as the cause of the multiple effect. As has been pointed out, *an evil means may never be used to attain an end, no matter how good and necessary that end may be*, for an evil means always contaminates the morality of the whole act. The military mind occasionally focuses its attention so much on the result to be achieved, that it fails to evaluate the morality of the means used. Such a tendency is morally dangerous. "Means" and "primary end" must always be considered together. Neither can be evil, otherwise an act is immoral. The end never justifies the means.

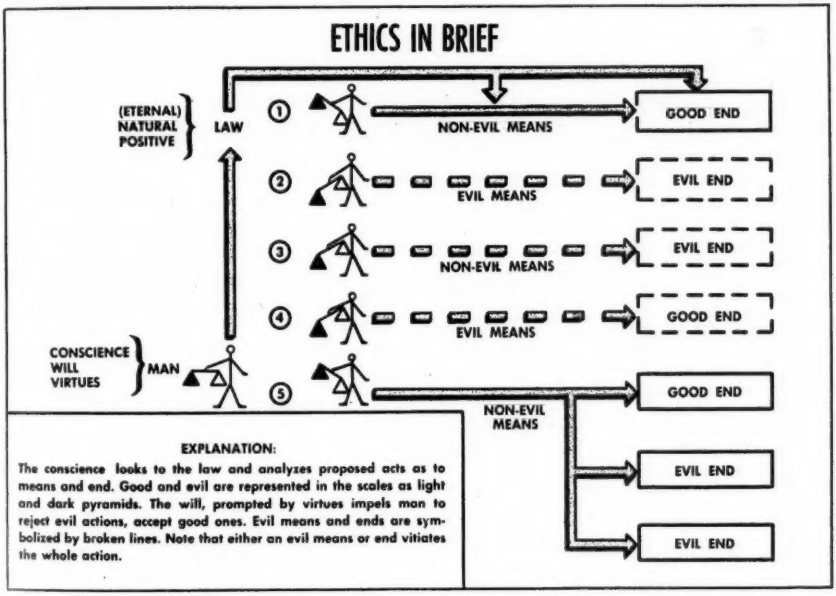
Special Problems of Military Ethics

Religious Worship.—The officer has under his command men of various religious beliefs. Therefore, he must avoid every form of discrimination for or against a soldier because of his religious affiliation. The Constitution of the United States vindicates freedom in the practice of religion for all American citizens, whether in military or in civil life. Accordingly the commander may not in any way hinder the religious activities of his men, whatever their creed, provided there is no interference involved with discipline and the reasonable demands of military duty. In

addition, the commander has a moral obligation to encourage his men to practice religion and to set the example in this regard himself.

Sex Morality.—Another problem of commanders concerns the matter of sex morality. This element has always been a source of trouble and difficulty in army life. Some armies have attempted to solve the problem by immoral means.

In dealing with sex problems of his men, the commander needs but inculcate


ETHICS IN BRIEF
(ETERNAL) NATURAL POSITIVE
LAW
CONSCIENCE WILL VIRTUES
MAN
1
2
3
4
5
NON-EVIL MEANS
GOOD END
EVIL MEANS
EVIL END
NON-EVIL MEANS
EVIL END
EVIL MEANS
GOOD END
NON-EVIL MEANS
GOOD END
EVIL END
EVIL END
EXPLANATION:
The conscience looks to the law and analyzes proposed acts as to means and end. Good and evil are represented in the scales as light and dark pyramids. The will, prompted by virtues impels man to reject evil actions, accept good ones. Evil means and ends are symbolized by broken lines. Note that either an evil means or end vitiates the whole action.

and enforce the one safe principle: restraint. The emotional conflicts and diseases which sometimes result from incontinence are but proofs of its immorality.

The Ethics of War.—It is sometimes morally right for one nation to take up arms against another nation. How is it possible to have moral certainty in regard to this principle? It derives from the concept of the state. The function of the state is to do by collective action what the individual is unable to do for himself or would be able to do only in a very inadequate manner. There will arise times when the single individual will be unable to protect himself against enemies from outside the state. He has then a right to call upon the state to do for him what he cannot do for himself.

The person or persons who hold supreme authority in the state have not merely a right but a duty to protect the lives and property of the citizens. Consequently, in accepting this office they become morally responsible for the duties that the office entails, and it may become a matter of moral obligation to enter into a war to protect one's country from serious menace from without or seditious rebellion within.

"Far from bringing forward an absolute condemnation against war, Scripture and Tradition abound in texts which bear witness to the lawfulness of recourse to vio-

lence when this becomes the sole means to obtain respect for justice and right," ("A Code of International Ethics," Paris, 1937). From this basic principle, flow the conditions for the morality of any war:

A war should be undertaken and carried out only by order of the Supreme authority in any state.

There must be a just cause for waging war. This matter is expressed succinctly in the "Code of International Ethics"; "The defense of an essential right, unjustly attacked, is the cause which justifies a *defensive war*; the vindication of an essential right unjustly denied, that of an *offensive war*; help asked by a belligerent who has just cause for war, that of a war of *intervention*."

No nation should ever enter upon an offensive war without first appealing to its antagonist to set up a board of arbitration and settle the dispute by peaceful means. Whenever a nation, in defiance of this principle of natural law, enters suddenly upon an offensive war, the *prima facie* evidence is that it is an unjust aggressor.

Conclusion

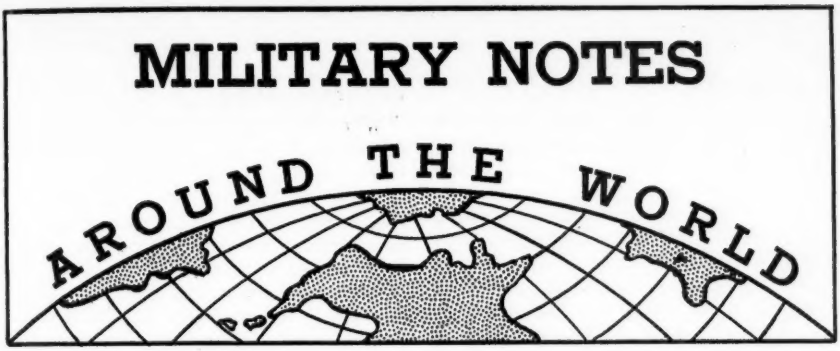
"Make us to choose the harder right instead of the easier wrong, and never to be content with a half truth when the whole can be won." General Omar N. Bradley crystallizes the necessity of a well developed ethical code in the military profession when he warns that the above words from the West Point Cadet's Prayer point to the worst pitfall into which men—beset by events—can fall: The willingness to compromise principles for expedient gain. The General says: "Knowing that the right road is also the harder one, we have an all-too-human tendency to choose the easier way. And, of course, the justification for our choice becomes a simple task. For we have great powers of rationalization when it comes to proving to ourselves that we have made either a 'reasonable' or a 'practical' choice.

"However, when we choose the easy way out of a difficult decision, we are only running away from reality. If the world is ever to become the peaceful world we want it to be, we must be prepared to live by principles—to pursue those principles completely and without reservation."

It is hereby declared to be the policy of the government to encourage and promote the religious, moral, and recreational welfare and character guidance of persons in the armed forces and thereby to enhance the military preparedness and security of the nation.

President Harry S. Truman, Executive Order, 27 October 1948

MILITARY NOTES



ARABIA

Dhahran Base

Dhahran Air Base, Saudi Arabia, under the jurisdiction of the European Air Transport Service, USAFE, is one of the most remote Air Force bases.

The air field was built by Army engineers in 1945-1946 as a base on the redeployment route from Europe to the Far East after the European war and as a link on the North African air transport supply route. The United States Air Force agreed to operate Dhahran for three years under the terms of an accord between the Saud, King of Saudi Arabia, and the United States, which specified that Saudi Arabia would take over operation of the base in 1949.

Fifty carefully chosen Saudi Arabian students are being trained in airport management by Air Force personnel stationed at Dhahran. They will assume operation of the airport when the United States forces leave. Their curriculum is organized in a military manner and is under the direction of the Air Force officer who commands the air base. Students are given instruction in control tower operation, aircraft maintenance, billeting, messing, weather, radio, supply procedure, airdrome maintenance, and all other pertinent subjects.—*Report of the Chief of Staff, USAF.*

AUSTRALIA

Training Plans

A completely new schedule of Army training plans, to be implemented in close association with the Navy and Air Force, is promised by the Army Minister, providing for much closer cooperation between the Army, primary industry and the public services. Army officers will be attached to government departments and to private industries so that they can gain a good general experience. They are at present studying primary industries and the public service, and will soon begin studies in commerce, science, foreign languages, and other useful subjects.—*Australian Weekly Review.*

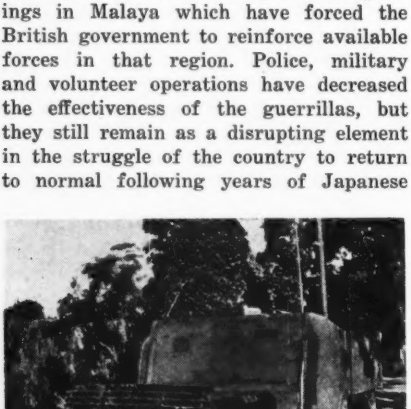
Atom Bomb Precautions

A national plan of defense against atom bomb attacks is being considered by heads of the fighting services and civil departments of the Federal government. Information gathered by British and United States authorities at Hiroshima, Bikini and Europe has been reviewed. It is expected that special regulations may be introduced for all major buildings, particularly those of strategic importance. A rigid frame with reinforced concrete design is likely to be developed.—*Australian News Summary.*

MALAYA

Armored Jeep

Novel methods have been utilized in combatting the Communist guerrilla uprisings in Malaya which have forced the British government to reinforce available forces in that region. Police, military and volunteer operations have decreased the effectiveness of the guerrillas, but they still remain as a disrupting element in the struggle of the country to return to normal following years of Japanese occupation during World War II. The rebels are mostly Chinese Communists.—*The Illustrated London News.*



Jeep converted into armored car for use as patrol vehicle.

BRAZIL

Joint Technical Commission

Brazil and the United States have organized a Joint Technical Commission to make a broad study of Brazil's capacity for economic development. It will analyze natural and capital resources; labor supply; fiscal and banking problems; domestic and international trade problems; and the position of Brazil in world economy.—*Bulletin of the Pan American Union.*

USSR

Ex-German Ships

When the incomplete 15,000-ton cruiser *Lützow* was acquired by the Soviet Navy from Germany for an undisclosed consideration in 1940, it was decided that she should be named *Petropavlovsk* and armed with guns of Russian manufacture. It is believed that this has been duly carried into effect, the main armament comprising ten 7.1-inch pieces in four turrets—"A" being triple, "B" twin, "X" twin and "Y" triple. Presumably the sister ship *Seydlitz*, which fell into Russian hands at Kaliningrad (Königsberg) in April 1945, has been similarly equipped. It is reported that she is now named *Poltava*, after Peter the Great's crowning victory over the Swedes.

The "pocket battleship" *Lützow* (ex-*Deutschland*), which the Russians refloated at Swinemünde in 1947, is understood to have been taken in hand for an extensive refit, with a view to her becoming a seagoing gunnery training ship for the Baltic Fleet. Probably her original main armament of six 11-inch guns will be changed to a Russian caliber.—*The Navy.*

Navy Training

Basic naval training for civilians without military experience, and refresher and training courses for demobilized veterans of the Soviet Fleet, are being given to "millions" of workers and peasants in the Soviet Union under the reorganized civilian defense program.

The purpose of the naval training is as follows:

1. To disseminate naval information among the workers.

2. To help Soviet youth to prepare themselves adequately for service on the ships, as well as to develop and cultivate water sports in every way possible.—*The New York Times.*

NORWAY

Army Problems

The Norwegian Army is in the process of reorganization. Judging from the military periodicals of that country, it is evident that the task of organizing an efficient fighting force is being pushed as rapidly as possible. Many obstacles, mostly financial, stand in the way of these efforts.

The present-day role of the infantry has been under discussion and the wish expressed that this branch of the armed forces be accorded priority in training and procurement of equipment, it being considered the principal arm of the country, with all other branches of the armed forces subordinate to it.

Nine large power stations are under construction in Norway today, and the plans have been completed for ten others. It is realized that the military aspects involved in protecting these plants must be considered when the plans are made. Norway is constructing most of her power stations underground, since it is impossible to give sufficient military protection to plants which are built in the open.—*Allgemeine Schweizerische Militär Zeitschrift*, Switzerland.

SWEDEN

Guided Missiles Research

It it reported that a Guided Missile Section common to all defense services in Sweden is to be set up within the Air Force Air Board. The staff will be supplied by the various branches of the services. Up to now, work on guided missiles has been carried out by all three services with a coordinating body. The time is now considered ripe to create one organization, and since questions concerning guided missiles are closely linked with aerodynamics and jet propulsion, it is natural that the section be attached to the Air Board.—*Journal of the Royal United Service Institution.*

BELGIUM

Primary Trainer

Belgian primary trainer, produced by Fairey, has a 145-hp Gipsy Major X engine, but can be fitted with a 155-hp

Belgian Trainer.

Cirrus Major III. Maximum speed is 135 mph; it will cruise for 395 miles at 104 mph. It is fabric-covered, but has all metal basic construction.—*Flying.*

FRANCE

Arsenal VB 10

Following the building of two prototypes, the Arsenal VB 10 single-seat two-motor fighter has now gone into production at one of the Aeronord factories. Two 1,500 hp Hispano-Suiza HS12Z liquid-cooled twelve-cylinder engines are mounted in tandem in the fuselage, with the pilot located between them. They drive two three-blade counter-rotating pro-

Arsenal VB 10.

pellers. Armament consists of two 20-mm cannon in each wing, and rocket projectiles or bombs carried under the wings. Maximum speed of the plane is 435 mph at 23,000 ft.—*The Aeroplane.*

GREAT BRITAIN

End of a Unique Regiment

The development of combined operations technique during the last war led to the formation of many new types of units. Among the lesser-known of these was the 34th Amphibian Support Regiment,

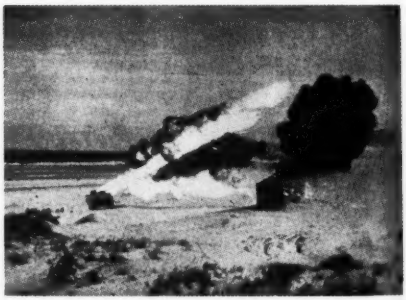
An LVT(R) in action.

Royal Marines, just recently inactivated. This unit is most interesting from the infantry and artillery point of view since it was developed to provide the close support so necessary just before and just after landing.

Investigation into the Dieppe operation revealed a weakness in the support plan of a combined operation. The weakness occurred in the period between the cessation of naval and air attack on the beaches and the opening of fire by close support artillery after the landing. Two methods were suggested to overcome this weakness. First, the building of Landing Craft Gun, Medium [LCG(M)] which could "flood down" and fire from the beaches. Second, by support from tanks firing from landing craft. To fulfill the latter solution the Army Support Group, Royal Marines, was formed and went into action on D-day in Normandy with *Centaur* and *Sherman* tanks embarked in landing craft. The tanks went into action on disembarkation.

The solution provided by the Army Support Group was not satisfactory. In the meantime, American development of the *Buffalo* produced the Landing Vehicle Tracked, Mark 4, armed with a 75-mm howitzer. This version was known as the LVT(A-4) and some of them became available for use by British Forces in the Far East in 1945. Part of the Army Support Group, which had been reformed as the 29th Infantry Battalion, Royal Marines, was moved to Aldershot to become the 34th Amphibian Support Regiment, Royal Marines.

The Regiment moved to India in 1945, collected equipment and trained for operations which were planned to take place in Malaya in September. The unit was organized into a headquarters, two support batteries each of three troops armed with



An LVT(Flame).

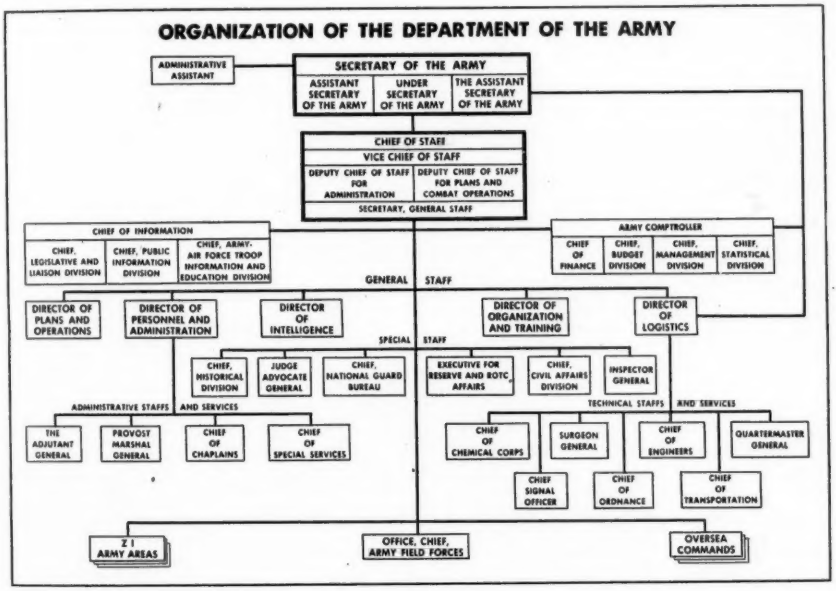
four LVT(A-4), one rocket battery of three troops of four LVT(R) and one flank battery of two troops of five LVT (F).

The LVT(A-4) could fire on the beach during the last five hundred yards of the run-in after beach-drenching fire had lifted and then give close support from hull-down positions in shallow water and later in the normal field artillery role until the normal divisional artillery could be landed to relieve the Marines. —*The Journal of the Royal Artillery.*

UNITED STATES

Army Reorganization

A top-level reorganization of the Army to place it on a peace-or-war functional footing was announced recently by Secretary of the Army Kenneth C. Royall, effective 15 November 1948.



In connection with the Staff change, one of the two Deputies will supervise Army administration, and the other, plans and combat operations. The Vice Chief of Staff, a new post created in place of the old Deputy Chief of Staff position, provides the Chief of Staff with an alter ego whose official acts shall be considered as emanating from the Chief of Staff and shall have full force and effect as such. In his new capacity, the Vice Chief of Staff will be available to release the Chief of Staff for field inspections at home and overseas, and for coordination with the military chiefs of the other defense departments. In all matters relating to the Army the Vice Chief of Staff will be principal adviser and assistant to the Chief of Staff.—Department of the Army.

The principal changes are (1) vesting in the Assistant Secretary (or the Under Secretary) over-all supervision of Army logistics, (2) grouping of the seven technical services directly under the General Staff Director of Logistics, (3) grouping of the four administrative services directly under the General Staff Director of Personnel and Administration, and (4) creation of a Vice Chief of Staff and two Deputy Chiefs of Staff.

New Medium Tank

The Ordnance Department has developed a new, versatile, hard-hitting, medium tank named the "General Patton" in honor of one of the outstanding apostles of armor in World War II.

Though the new tank is superficially not greatly different from the present standard M-26 medium tank, several improvements give it greater speed, increased reliability, and more maneuverability.

A compact new air-cooled engine gives the M-46 tank 62 per cent more power than that delivered by the plant of the M-26, but does not occupy so much space. The increased power—from 500 hp in the M-26 to 810 hp in the M-46—increases the speed of the new tank 50 per cent over the old one, from 20 to 30 mph.

Improved traction through new design of tank treads is an important feature of the M-46. A water-proofed electrical system permanently shields all circuits, and with special intake and exhaust stacks added the M-46 can ford streams deep enough to cover the entire engine. When winterized, the M-46 can operate in temperatures as low as —65 degrees Fahrenheit.—Department of the Army.

The M-46 "General Patton" medium tank armed with a 90-mm high velocity gun. —US Army photo.

Above, the M-46 tank demonstrates its greater power by outclimbing an M-4 on an inclined test course; the M-4 is on a 30 per cent grade, while the M-46 outclimbs it on a 40 per cent grade. Below, demonstrating the maneuverability of the new tank, the M-46 is shown spinning on its own treads, outmaneuvering the older M-4 which started spinning from the same position.—US Army photos.

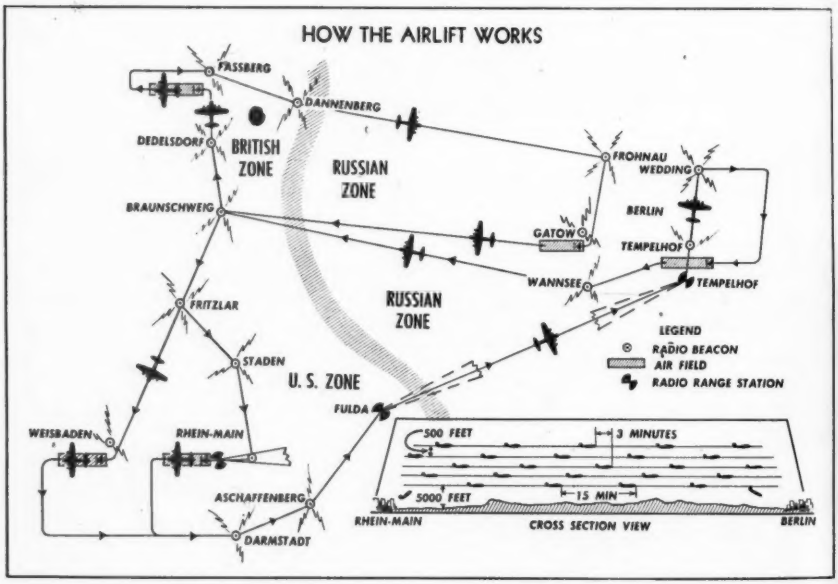
Berlin Airlift

Since 26 June 1948, all land communications between Berlin and the western zones of occupation have been cut off. The Western Powers, United States, France, and Great Britain, occupying sectors in Berlin in accordance with agreements reached at Yalta and Potsdam and agreed to by representatives of all the World War II Allies, thus have had to use air transport in order to take sufficient supplies into Berlin to sustain civilian life in their respective sectors.

The airlift was begun with a small force of C-47 type aircraft, but it soon became apparent that a greatly increased capacity would be required. Prior to the establishment of the blockade, about 8,000 tons of supplies were shipped by truck, rail and water into the western-controlled sectors of Berlin each day. However, it was determined that minimum standards could be maintained if 4,000 tons could be flown in daily.

To reach this figure, C-54 type aircraft were brought in from Tokyo, Texas, Hawaii, Alaska, California, Massachusetts and many other places for airlift use. By 31 July, 2,000 tons had been exceeded and the daily tonnage continued climbing until by 18 September the average tonnage hauled was more than 4,500.

Air field facilities at the ends of the airlift routes have been greatly expanded to care for the added traffic load. Additional runways have been constructed and navigational aids of all descriptions have been installed to insure continuous operations, even under adverse weather



Schematic diagram showing routes, radio ranges, airport locations, and actual operational procedures followed by the planes flying the Berlin airlift.—US Air Force chart.

conditions. By 25 October, 310,994 tons of food, coal and other vital supplies had been flown into Berlin by US Air Force transport planes, flying more than 20,000,000 miles in 137, 975 hours.

The airlift is by no means only an American accomplishment, however. In the same period shown above, transport aircraft of the British Royal Air Force had flown approximately 135,690 tons of similar cargo to Berlin in 25,642 RAF flights.

About 230 four-engine Douglas C-54 Skymaster planes are currently assigned to fly the corridors, as well as five Fairchild C-82 Packets which are used for shipment of bulky items. Of these planes approximately half are Military Air Transport Service aircraft. The remainder are Troop Carrier planes and US

Unloading supplies from C-47s on the ramp at Tempelhof in Berlin.—US Air Force photo.

Navy R5D's, the naval version of the Douglas C-54 transport, which have been assigned to the Berlin airlift by MATS. Additional naval support is given by Navy tankers which transported more than 40,000,000 gallons of aviation fuel to Europe during the first four months of airlift operations.

To complete the picture showing that "Operation Vittles" is a joint effort,

Lengthening a runway at Tempelhof without a let up in operations.—US Air Force photo.

it must be mentioned that the ground transportation of supplies being moved from Allied ports to the take-off points is the responsibility of the Department of the Army. Hundreds of trucks, fleets of barges, and special freight trains controlled by the Transportation Corps carry the supplies to the air bases where the flow of air cargo into Berlin is carefully monitored by Army control officers. Also, Army engineer troops have been assigned to maintain the runways and base facilities both in Berlin and in Western Germany.

A special training school for aircraft replacement personnel has been established at Great Falls, Montana, where a "little corridor" similar to the real one in Germany has been established.—Department of the Air Force.

Arctic Clothing

The Army, "preparing for any eventuality which might find our troops engaged in Arctic operations," has developed experimental, lighter-weight Arctic clothing.

The Chief of the Military Planning Division of the Office, The Quartermaster General, reports the new clothing weighs twenty-one pounds and will protect a man at 55 degrees below zero. The present standard clothing ensemble weighs twenty-five pounds and protects a man at —40 degrees.

The Army also has developed a catalytic heating pad that will keep a sleeping bag heated for twenty hours. This bag would be used to evacuate wounded soldiers.—News Reports.

Assault Food Packet

A new experimental assault food packet, designated to sustain a soldier in combat for twenty-four to thirty hours while isolated from his company or base, was tested by EUCOM combat troops during regular maneuver exercises held at Grafenwohr, Germany. The packet, containing meat, vegetables, fruit and other items, was previously tested in the United States by the Department of the Army.

The individual weight is approximately two pounds and the ration is packed in six tin containers and two small waterproof paper bags which hold accessories.

Quartermaster field survey teams observed its acceptance by troops, to determine which components were likely to be discarded.—*Army and Navy Journal.*

German Submarine

The Navy announced recently that a former German submarine, the U-1105, was sunk in Chesapeake Bay in tests to determine the lethal range of depth charges.

New equipment and techniques for raising sunken submarines is now being tested, using the U-1105 as the "guinea pig."—*Armed Force.*

Courts-Martial Changes

Changes in Army courts-martial procedure through a revision of the Articles of War were enacted as a part of the Selective Service Act of 1948. Some of the salient points of the statute, which becomes effective 1 February 1949, are:

1. Enlisted men have been authorized to sit as members of general and special courts-martial upon the written request of accused enlisted man.

2. The authority of commanding officers to impose disciplinary punishment under the 104th Article of War as to officers and warrant officers has been extended, but not as to enlisted men. Under this Article commanders who are authorized to appoint general courts-martial may impose a forfeiture of one-half pay per month for three months upon officers (both field and company grade) and warrant officers in peacetime or in war.

3. Officers are subject to trial by special courts-martial.

4. Qualified lawyers are required as law members of general courts-martial; if the prosecutor is a lawyer the defense counsel must also be a lawyer.

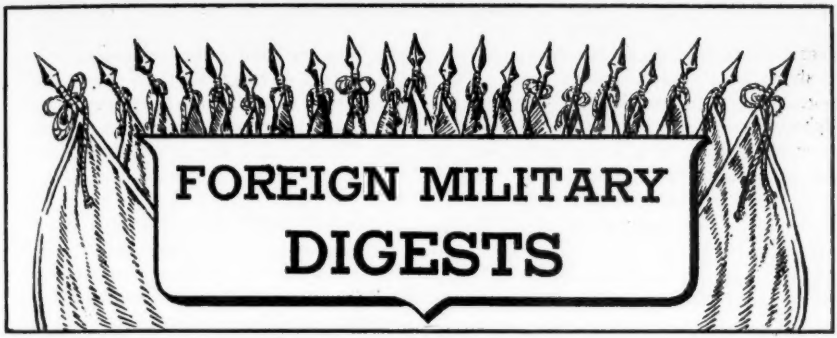
5. An accused, if he so desires, may have counsel at the pre-trial investigation which is in general parallel to pre-trial procedure in civil courts.

6. A bad-conduct discharge, which is less onerous than a dishonorable discharge, may be adjudged by general and special courts-martial.

7. Automatic appellate review has been strengthened.

8. Heretofore a sentence to death or imprisonment for life was madatory for murder or rape. A lesser punishment will now be authorized for unpremeditated murder and for rape.

9. Specific provisions have been made to prevent officers appointing courts-martial from exercising any coercion or undue influence upon the members of a court.—Department of the Army.



Airborne Forces

Digested by the MILITARY REVIEW from an article by Air Chief Marshal Sir John C. Slessor in "The Army Quarterly" (Great Britain) July 1948.

THE airborne forces of the Army won wide and well-earned fame in World War II. But I am not sure they have yet been the subject of all the clear and unemotional thinking they deserve if we are to progress on the right lines in this form of air/land warfare.

Airborne Policy

Our policy for airborne forces and supply in the future must be based on something more solid and prosaic than a glorious and romantic tradition. The whole picture must be viewed in its proper perspective—with imagination and vision, but at the same time dispassionately and objectively. We must face squarely what in actual practice we are likely to be *able* to do and what it will cost us to do it. That means facing the realities of the conditions in which air transport support and air supply was used so effectively last time, and of its cost in British and American effort in the years 1940 to 1945.

I happened to be closely associated with the earliest beginnings of airborne forces in this country when I was serving as Director of Plans in the Air Ministry, and I very well remember the day in June 1940 when we received one of Mr. Churchill's characteristic minutes: "Let there be at least 5,000 parachute troops. Pray let me know what is being done"—or words to that general effect, crowned with the well-known tab "Action this day." The Prime Minister had been deeply impressed by the bold brutality of the airborne landings in the Norwegian campaign, when JU—52s full of storm-troops poured into Fornebu, by the parachute descents on the Hague in the invasion of Holland, the crash-landings on the beach at Scheveningen and the glider-borne capture of Fort Eben Emmael. If Mr. Churchill had allowed himself to be influenced too much at that time by the ways and means and considerations of strategic priority we might perhaps have lost the war.

The Air Staff, on the other hand, was paid to think of these things and two considerations were very prominent in their minds. First, it had not escaped the staff that these very successful enemy airborne operations (as the later ones against the Corinth Canal, in Crete and in Java) were undertaken against weak or negligible opposition from the ground and in conditions of absolute air supremacy. They believed, as they still believe, virtually complete air superiority to be an essential prerequisite to the successful conduct of airborne operations and so may perhaps

be excused for failing, in the circumstances, to share the Prime Minister's sense of the urgency of the immediate initiation of an airborne force. Second, the Air Planners, in collaboration with their colleagues of the Army and Navy, were then engaged in an examination on behalf of the Chiefs of Staff of our future strategy following the fall of France.

There seemed every prospect of England being invaded before the autumn and, with the Continent in the grip of the Axis, the planners came to the conclusion that our hope lay in securing our island base and sea communications, while developing to the full the only means we had in the foreseeable future of striking at the enemy, namely economic pressure and the bomber offensive. Of these, the value of the first was extremely problematical, while for the second our resources at the time were almost ludicrously inadequate.

In spite of this situation, the Prime Minister's instructions were obeyed, personnel and aircraft were made available and the Parachute Training School was opened at Ringway. But it may perhaps be understood why the Air Staff at that time did not fling themselves into the development of air transport support with quite that single-minded enthusiasm that its early protagonists expected. *The first thing we had to do was to win the air war.* And to do that meant not only expanding Fighter Command and repairing the ravages in our fighter force occasioned by the defeat in France, but also steadily setting ourselves to build up Bomber Command from its then almost negligible strength. In the summer of 1940 there was not the remotest prospect of our being in a position to undertake airborne operations in the then foreseeable future—actually it was three years later that the first airborne assault on a serious scale was staged in the invasion of Sicily. We could, and did, start training parachute troops, adapting such aircraft as could be made available and developing the technique. But in the second quarter of 1940 our monthly average production of twin-engined aircraft in this country (including the obsolete Whitley and Blenheim) was 288, of four-engined aircraft *one only;* and we had no American supplies (our corresponding figures four years later were 476 and 460, and we had secured thousands of twin-engined aircraft, including the invaluable Dakotas, under lease-lend from the United States). It will be obvious, therefore, that while we could begin the training of 5,000 parachutists, there was no prospect whatever of being able to produce the aircraft or crews to drop them in action, tug them in gliders and supply them by air within a period to be measured not in months but in years. The Chiefs of Staff and the Prime Minister endorsed the conclusions of the Joint Planners referred to above; our aircraft industry was geared to the great heavy-bomber program which made possible the development of Bomber Command as it was in 1944-45; and in the autumn we turned to the "Arsenal of Democracy" to supplement our own industry by the production of more bombers and of the transport aircraft for which we had no capacity in England. The Air Staff had many shortcomings, but they were deeply imbued with a sense of the vital importance of two principles: the need to achieve air superiority before any other operations by land or sea could have a chance of success; and the need to concentrate the greatest available effort on the task which alone held out a prospect, however distant, of decisive effect. That, by common agreement at the time, was the bomber offensive. The knowledge that the second course was an essential factor in the success of the first led the Air Staff to set their faces against the diversion of striking power to any purpose other than one which threatened temporarily to be decisive *against us*—such as the menace of the U-boat or the threat to Egypt in

1942. When one is on the strategic defensive, it is sometimes essential to divert potential offensive capacity to defensive purposes, to stave off disaster. Fortunately by the beginning of 1943 the whole picture had changed.

Air Superiority Required

The first point in a future airborne policy is that neither the operation of airborne forces nor supply by air on a serious scale will be practicable except in conditions of virtually complete air superiority. It was by no chance that the Germans never undertook an airborne operation after the capture of Crete. To the end of the war they had their so-called parachute divisions, but never were they used again for the purpose for which they were designed. The reason is plain. The enemy recognized, as we had recognized earlier, that airborne operations against an enemy unbeaten in the air are a spectacular and expensive form of mass suicide—a truth that was sharply underlined by the slaughter of the ME-323 powered gliders, full of reinforcements, by the British and American fighters of the Desert Air Force just before the capture of Tunis.

Action during the great Allied Airborne Army invasion of Holland in September 1944. Troop carrier formations fly overhead as other planes drop parachutists (lower left). —US Army photo.

Second, the great Allied airborne op-

erations of 1944 did not take place till the middle of the fifth year of war, when the whole industry of Britain and America was fully mobilized. At the time of the Normandy landings the production of multi-engined aircraft in America and this country averaged over 3,600 a month. At the time of the crossing of the Rhine there were about 1,800 troop-carrier and transport aircraft and glider-tugs available to the Allied Forces in Germany. I do not pretend to have attempted even a rough estimate of the total cost of airborne forces by the end of the war. But I believe it to be no exaggeration to say that, compared to that cost, the much publicized 500 million pounds spent on the atom bomb would not appear a very formidable figure. Whether all that expenditure of national effort here and in America was justified by results or whether equivalent or greater dividends might not have resulted from its investment in other forms of force, I would not care to have to say. The curious thing is that, as far as I know, no such objective appreciation has ever been made.

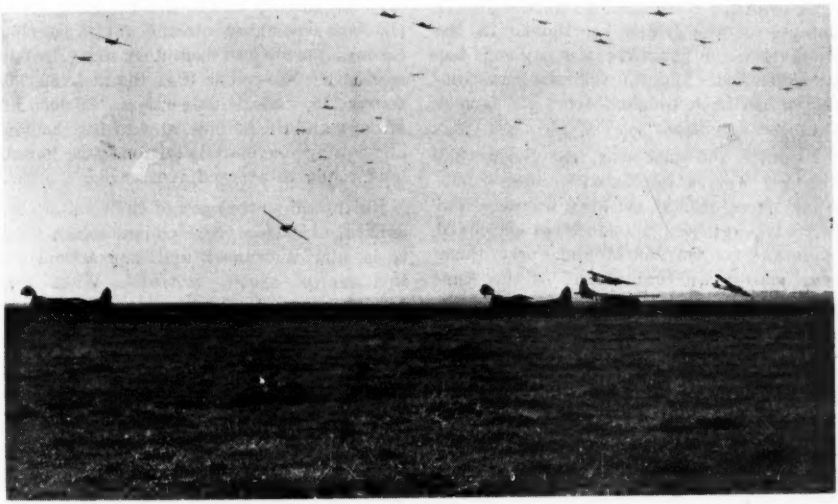
What we should now be considering in the light of past history is this: on the assumption that a major war on anything akin to traditional lines is a contingency to be seriously reckoned with in the future, is there really any reasonable possibility of airborne operations and air supply on a serious scale in, say, the first two years after the outbreak? Bearing in mind always that air superiority, other than of a purely local and very precarious nature, is a long-term investment, is there really any chance of us and our Allies achieving within two years that degree of air supremacy required for the operation of great fleets of troop carriers and supply aircraft? And, finally, is there any prospect of ourselves and our Allies being able to produce within that period those great fleets of aircraft, their skilled crews and trained maintenance personnel and the enormous training organization required to back them?

I cannot bring myself to believe that these things are within the bounds of practical possibility.

That clearly does not mean that we should drop airborne forces. If we were ever to find ourselves again in a prolonged world war we must be in a position to undertake airborne operations and supply by air of armored forces as soon as the air situation and the production situation permits, and we could not do that even in two years or three unless we "keep the art alive." We must go ahead with research and with technical and tactical development. We must keep abreast of the times and develop a sound basis of training and tactics, both of airborne troops and the aircraft that carry them; we must design, prototype and test the aircraft and equipment that will be needed and must see to it that, so far as is commercially possible, the design of civil aircraft incorporates such features as may be necessary to make them easily adaptable to the military transport and supply role. In doing that, however, we must be realistic. It is just no use discussing today the provision of military aircraft and gliders to carry, for instance, 30-ton tanks. Technically it would not be impossible to design and build them; but practically it would not make sense. Just as at sea we have in war to rely in the main on the ordinary merchant ship for the transport of troops and equipment, so in the air. So it will be in the future. If we imagine that either in peace or in war we shall be able to afford to build up in the RAF a fleet of specialized military transports capable of carrying each and every load that the soldier would like to see carried, or that we shall be able to persuade commercial operators to use aircraft primarily designed to carry these military loads, we are living in a fools' paradise.

Conclusion

The basis of our policy for airborne forces in peace should be research and development aimed at operations on a major scale, and the maintenance of small but highly specialized and trained airborne units for small-scale sabotage activities, which I think would be practicable and might have invaluable effect in the early stages of a war. It may be also that we can achieve real economies with added efficiency in police and occupational duties in peace by concentrating our garrisons and using air transport to get them to wherever they may be required quickly. That means that all Army units with their first-line transport and supporting weapons must be air transportable and we must retain in the RAF enough transport squadrons to provide some air mobility in an emergency to the Army as well as to ourselves. I do not believe we can do more. I do not think we can afford, in these impoverished days, the manpower, the material or the money to maintain in peace airborne divisions with all their mass of specialized equipment, or the enormous numbers of aircraft required to lift them.



Gliders land men and equipment of the 101st Airborne Division in a field near Zon, Holland, back of the German lines, in September 1944.—US Army photo.

Australian Army in World War II

Digested by the MILITARY REVIEW from an article by Lieutenant T. A. Gibson in "The Army Quarterly" (Great Britain) July 1948.

THE decision of the Australian government to maintain the Permanent Military Forces of the Commonwealth at a strength of 19,000 is encouraging to all Australians who are concerned about the future defense of the island continent. In the wake of this, a generous new pay code has been granted. Regular soldiering in Australia has been uplifted from its former stagnant condition.

Prior to the past war, the Permanent Military Forces numbered a mere 3,000. Apart from coastal artillery gunners and fortress engineers stationed at defended ports and the Darwin Mobile Force, these were mainly warrant officers of the Australian Instructional Corps engaged in training the Militia. The regular officers were graduates of the four years' course at the Royal Military College, Duntroon, at Canberra. These officers of the Australian Staff Corps provide a professional nucleus in time of war.

Primarily a citizen soldier, the Australian's sense of individualism does not lend itself well to the idea of soldiering as a career or even to compulsory training. Yet, he is able to be drawn voluntarily to the Army in his own time. The prewar strength and keenness of the Militia forces illustrated this fact. Every suburb and country town had its drill hall, the members of which went under canvas yearly for a hard gruelling from the Australian Instructional Corps. The ranks of the Light Horse regiments were always swelled with the sons of squatters, farmers and graziers. Rifle clubs flourished in every country district. It was these peacetime militia men who thronged the recruiting offices at the outbreak of war and filled the ranks of the Second Australian Imperial Force (AIF).

Even during the war that old bugbear of Australian defense, conscription, was introduced for home defense only. As was its fate in World War I, it was defeated for overseas service. But until the vast growth of the Indian Army after the Japanese entry into the war, Australia claimed the largest volunteer army in the world. By November 1941 she had 152,000 troops in the Middle East, 20,000 in Malaya and the islands, and a fully trained and equipped armored division in the homeland ready to proceed overseas.

But proud as they are of their voluntary enlistment system, Australians admit that it is now outmoded and impractical in this era of global warfare. When the Japanese struck southward and the impetus of their advance was halted a bare thirty miles from Port Moresby by a hastily recalled ex-Middle East division, it was realized that Australia's survival in the face of such a powerful and numerous enemy depended on placing in the field every available man. From time to time the question of employing Militia troops overseas inflamed Federal politicians.

In wartime the prestige of the Militia, being home-defense conscripts, is almost non-existent. During 1942, the darkest hour of her history, Australia was in the embarrassing position of having two different armies: first, the AIF, volunteers ready to serve in any part of the world, and secondly the Militia, conscripted trainees unable to be sent beyond the limits of Australian mandated territory in New Guinea. It was embarrassing in that American conscripts were defending Australia by serving in the same theater of war. Naturally a great deal of antipathy existed between the AIF veteran and the Militiaman. However, this ill-feeling was gradually overcome by Militia formations

going bodily over to AIF, until the entire forces merged under the title Australian Military Forces (AMF). By the end of the war, three full ex-Militia divisions had been in action in the islands.

Some of the most stirring Australian war history belongs to the old 1st Australian Corps consisting of the Sixth, Seventh and Ninth Divisions and Corps troops (the Eighth Division was in Malaya). It was under the command of Lieutenant General, later General, Sir Thomas Blamey, whose ambition that the AIF should fight as a Corps was unfortunately never realized.

The Sixth Division, raised in 1939, were originals of the old Imperial Army of the Nile, and fought in the van in the first Libyan campaign. Flanked protectively by the Imperial Seventh Armored Division, the Sixth stormed Bardia and Tobruk, took Benghazi and penetrated as far south as El Agheila. This glorious succession of victories has been somewhat overshadowed by time and fresher conquests, but it must be remembered that in those days the exceedingly numerous Italians were an unknown quantity, and the shattering of Graziani's legions and fortresses raised Allied morale tremendously. Withdrawn to Egypt, the Sixth sailed for Greece to become embroiled in that bitter and exhausting retreat. Here that memorable formation of World War I, the Anzac Corps, was temporarily reborn when the Sixth Australian Division and the Second New Zealand Division fought side by side against the invading German *panzer* columns. Evacuated to Crete, the Sixth fought in the short, savage campaign of three weeks in the then new airborne warfare. When it returned at last to Palestine, it was depleted almost beyond recovery, having fought three major campaigns in six months and endured fearful casualties. Its commander was Major General Sir Iven Mackay, a former Melbourne public school headmaster and now Australian High Commissioner in India, who was knighted for his brilliant command in the desert.

The Seventh Division saw birth in early 1940 and was in the fierce but hushed-up Syrian campaign a year later. The Vichy French were superior in tanks and aircraft and severe opposition was encountered from such tough mercenary and colonial troops as the Foreign Legion and the Senegalese Units, particularly at Merdjayoun and on the Litani and Damour Rivers. The main Australian advance was along the coast, Tyre, Sidon and Beirut being taken in the six weeks of hostilities. The commander of the Seventh Australian Division was Major General Sir John Laverack, a regular officer and later commander of the 1st Australian Corps, who is now Governor of Queensland.

The Ninth Division, under Sir Leslie Morshead, a Sidney shipping executive, fought in the siege of Tobruk for eight months, after taking the shock of Rommel's lightning counterattack against the sparse occupational forces of Cyrenaica. The Division fell back on Tobruk and turned at bay. Returning in August 1941 and ensuing months to Palestine, which was AIF Base Area, it eventually joined the 1st Australian Corps in Syria, where the AIF was carrying out the duties of army of occupation and the defense of the Turco-Syrian border. When the AIF was recalled to Australia in early 1942 in view of the imminent Jap invasion, the Ninth endured the bitter pill of farewelling the Sixth and Seventh and Corps troops while it remained in the Middle East. By April 1942 the strength of AIF was 32,000. After being a spearhead of the breakthrough in the north, it pulled out of the chase at El Daba and returned again to Palestine. In January 1943, the Ninth Division embarked at Port Tewfik for home.

The advent of jungle warfare changed

the AIF. European organization was scrapped; armored and heavy artillery units were disbanded; long jungle greens replaced the khaki shirts and shorts. The steel helmet was no longer worn religiously in action, always the slouch hat. Malaria, dengue fever and the dreaded scrub typhus were enemies as formidable as the Jap sniper and the "woodpecker" heavy machine gun. Versatility was the keynote of training. Accent was placed on amphibious and airborne landings. The AIF was the first to parachute into action an artillery regiment complete with its 25-pounders. It was also first to defeat decisively the hitherto victorious Japanese Army—at Milne Bay, southeast of New Guinea, in 1942. It fought and won in some of the wildest terrain in the world, in New Guinea, Bougainville, New Britain and Borneo. The tragic loss of the Eighth Division in Malaya, Amboina and Rabaul was fully avenged by the new AMF.

Today the AMF consists only of 10,000 short-service troops in Japan. But now the horizon looks clear for the building up of a well-trained and disciplined force which will serve the country well at the sudden outbreak of any further hostilities. With larger defense commitments for her protective belt of islands in the north and to hold her rank as a leader of the Southern Pacific, Australia must look to her permanent army.

An Allied Error?

Translated and digested by the MILITARY REVIEW from an article by Lorenzo Reggiani in "Rivista Aeronautica" (Italy) April 1948.

WITHOUT doubt, one of the important decisions of World War II was the Anglo-American decision to attack Europe from the south, directing their efforts against Italy alone. The result was the invasion of Sicily, and, a short time later, the invasion of the Italian peninsula. Was this an error? Together with other military critics, we believe that it was. While we must admit that errors were committed by both belligerents, in the end, victory smiled on the one that committed the least number.

But once insular and southern Italy were occupied, in what direction should the Western Allies have aimed their blows? At further advances in Italy, at the Balkans, or at both these peninsulas? It is true that the Anglo-Americans did not yet know for certain whether intervention on their part in the Balkans would or would not be well received by the Kremlin. In case of such intervention the landing of a large expeditionary force in Greece or in Yugoslavia could give Moscow the impression that the Anglo-Americans were trying to force themselves into the presumed zone of Russia's influence.

For a long time Stalin had been calling for creation of a second front in Europe, which would relieve his armies from the terrible grip of the *Wehrmacht*. In reality, it must be recognized today, the landing of the Anglo-American troops in Sicily in July 1943 had created a southern front in Europe, notwithstanding its limited development, and on the basis of this the German command was then forced to guard against a series of large landing operations on the Mediterranean coasts. The second front passed, thus; from the war of nerves to strategic reality.

In May 1943 Stalin was proclaiming, in Moscow, the necessity of a mass attack against the European coasts facing the Atlantic, and on 27 June he wrote

Roosevelt in regard to this matter: "Victory will undeniably be won more rapidly if we attack the common enemy in a coordinated manner from the west and the east." This implied that the Anglo-Americans were not to trouble themselves about southern Europe, particularly the Balkan peninsula.

The Allied conferences at Quebec, Moscow, Cairo, and Teheran dealt with operations in the Far East, with the Teheran conference, which occurred in the latter part of November 1943, dealing also with operations in Europe. By this time, the Anglo-Americans had moved up Italy as far as the Garigliano and Sangro Rivers.

The questions the Western Powers again asked themselves at this time were of great importance, and the decision with regard to them was, without question, heavy with consequences for the subsequent course of the war. Ought they to continue in north-central Italy; should they make a landing in Greece or Yugoslavia and direct their course northward across the Balkan states; or should they advance at the same time, both in Italy and the Balkans? Desirable and ambitious strategic prospects were offered the Allies either by way of the Paduan or Magyar plains, or even the plains of Poland. This last objective (in view of the development of the operations on the eastern front) could be reached by the Anglo-Americans by using the known routes from the south, and by the Russians from the east, thus crushing the German forces between them or surrounding them and cutting off their retreat routes to Germany. Much time would have been required for the preparation of any such operations to be engaged in simultaneously by the western and eastern Allies, but they would have met with decisive and rapid success. The Anglo-American landing in Normandy obviously could have been conducted on a greatly reduced scale, as compared with that on which it was carried out in June 1944.

These considerations serve to present an idea of the immensity of the plan, and of the results that would come from it.

Summarizing these ideas, we believe that one of the errors committed by the Anglo-Americans during the second phase of the war was to have attacked Italy from the south, without also attacking the Balkans through Greece or Yugoslavia. It is well known that they experienced a slow and by no means easy advance along the Italian peninsula, and were halted over a period of many months at the Gothic line, while at the same time, Russian troops in the northern Balkans advanced farther and farther westward, meeting Tito's forces near the Izonzo.

If the Anglo-Americans had also advanced across the Balkans, they and not the Russians would have reached the central part of Europe, which would have permitted them, and not the Russians, to occupy the Yugoslav and Austrian territory, as well as a good part of east-central Germany. Acting in this manner, the Anglo-Saxons would have checked the Russians from advancing their own fighting fronts into central Europe, except at Berlin. The political and military situation that would have resulted would have been far different then and now. Also by advancing deeply beyond the northern Balkan area, the Anglo-Americans would have created a very serious threat to the eastern flank of the German forces stationed in Italy and would have caused the early fall of those forces, forcing them to leave Italy and retreat to the Alps.

Spain—A Factor in European Politics

Digested by the MILITARY REVIEW from an article by Cyril Falls in "The Illustrated London News" (Great Britain) 29 May 1948.

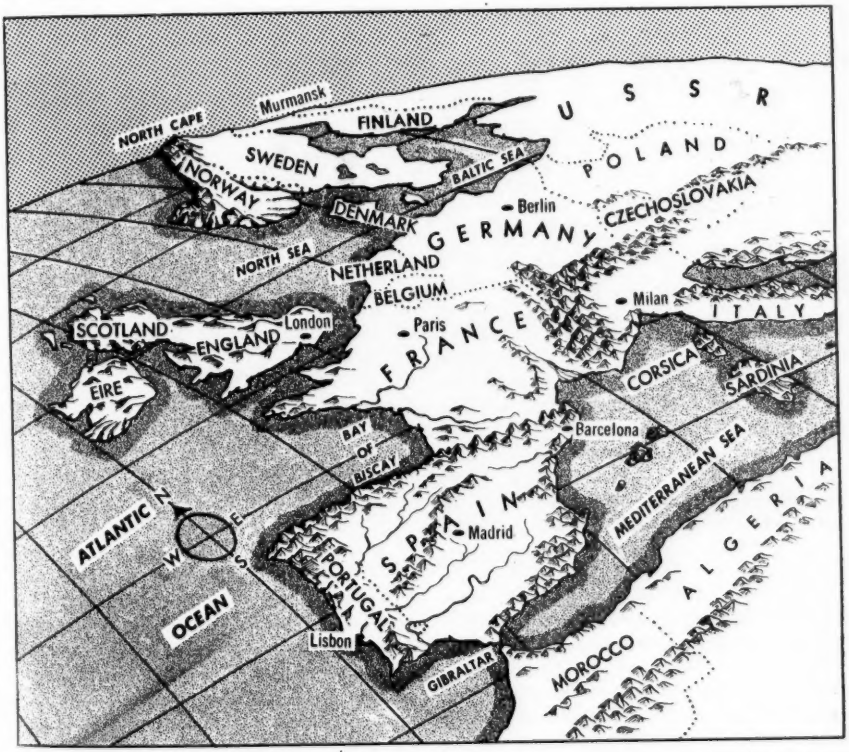
THE Prime Minister and the Secretary of State for Foreign Affairs recently made "full dress" speeches in the House of Commons on the international situation without mentioning Spain. Since Spain and her future are very much in the public eye, it must be supposed that this omission was deliberate. And, if that were so, the reason can only have been caution. Caution in such matters does not always merit the harsher term of timidity. For example, when a problem appears which excites strong feelings, but seems likely to solve itself, there is justification for saying as little about it as possible in the interim. The Spanish problem, however, does not appear to be nearer solution than it was a year ago. At the same time, it has become of higher interest owing to the general trend of European politics, one may indeed say of world politics. The tension between Soviet Russia and the West, the European Recovery Plan, the Brussels Pact, and outside official politics the remarkable progress of the United Europe movement: all these make the eye of the politician and the strategist turn towards Spain. If Mr. Atlee and Mr. Bevin decided not to talk about Spain, they assuredly did not fail to think about her. It would seem that the commentator, at all events, may perform a useful service in discussing her situation.

Before we go to politics and strategy, let us glance for a moment at the economics of the question. These matters have become almost as normal as they are anywhere in this crazy Europe of today, where governments in their profound wisdom have returned to the system of barter of savage tribes. It has been recognized by other countries that they cannot get along without trade with Spain. We ourselves have treated Spanish sherry rather better than Portuguese port. France made the gesture of closing her frontier with Spain and bringing Franco-Spanish trade virtually to an end. Yet she did not persist in this policy, which actually ended in a rather humiliating way, though her prestige was spared, because what happened was not made public. When the French suggested that the frontier should be reopened, the Spaniards, in their offended pride, kept them waiting for several weeks before they agreed. As regards ourselves, it has just been announced that an agreement is to be submitted to the British and Spanish governments for the export by Spain to Britain of pyrites, potash, iron ore, olive oil, fruits, and other food, in return for coal, machinery, and chemicals. This is the type of barter agreement which will never see Europe out of her troubles, but at least it affords proof that the need for Anglo-Spanish trade has been found to be increasing.

The partial and half-hearted economic boycott being over, the arguments for and against the admission of Spain to Western European comity, which would mean admission to the European Recovery Plan and to the Western Union, may be taken under the headings of morality and strategy, though it is only in the first of these that there are serious objections to be considered. The case in favor of revision of policy with regard to Spain is briefly as follows. Both the European Recovery Plan and Western Union are in part defense against Russian nationalist expansion and in part defense against Communism. The Spanish government is anti-Communist, and evidence points to the sentiment being shared by the nation as a whole. Whatever may have been the attitude of Spain during the war, it is il-

logical to try to justify a policy of exclusion upon it now that states which were actively hostile have been invited to join the European Recovery Plan and one of them, Italy, has already joined it. What is even more important, Spain has shown no signs of nurturing either territorial ambitions on the one hand, or a desire to impose the particular ideology of her regime upon other nations on the other.

cratic countries should now exercise united pressure to bring the present Spanish system to an end. But perhaps this is a question of tactics rather then morality: as much as to say that closer relations with Spain would involve the loss of forces holding the left wing of the anti-Communists' array, forces which it does not feel itself able to do without. The strongest and most truly moral argument is that disap-



On the other side, the argument is put forward that many anti-Communist elements in Europe would be offended and estranged if the European democracies were to establish closer relations with Spain. The leader of the right-wing Socialists in Italy has pleaded that the democratic approval of Communism—or, for that matter, fear of it—ought not to lead to a step so positive as approval of a regime which, it is stated, is equally far removed from the principles of democracy.

When we turn to the strategic aspect, we find ourselves on less disputed ground.

Taken as a whole, Spain is a natural stronghold. Her frontier with France is immensely strong, and an army which contrived to pass the Pyrenees by the few routes suitable to military traffic would have but begun its task, because its communications would remain vulnerable and, even if they were not attacked, would always prove a weak point. Within, the country rises towards its center, north of Madrid. The mountains and the main rivers, most of which flow to the west, continue to lie across the path of the invader. Spain is indeed a most difficult country to invade, and one still more difficult for an invader to maintain himself in. The easiest passages are those from Portugal, as Wellington proved; the next easiest are from the seaboard between Barcelona and Tortosa. In the present situation, however, it is impossible to imagine Spain standing in risk of invasion from either of these quarters. In the second place, Spain covers the entrance to the Mediterranean. It is true that the great fortress overlooking the strait, Gibraltar, is in British hands, but the gateway of the Mediterranean would obviously be much more strongly held if the gateposts and the walls supporting them were in the hands of forces prepared to join in defending them.

When, however, we talk of gateposts, we have to turn our eyes to territory outside Spain itself, to the other side of the strait. And once Africa comes into the vision a new set of considerations appears with it. It is not enough to say that the opposite gatepost is in Africa and in Spanish African territory. The situation in the Mediterranean, with which Britain first struggled alone and then with powerful aid of the United States, was as difficult as we found it because the central section of the North African seaboard was in hostile Italian hands and the western in neutral French and neutral Spanish hands, with Calabria, Sicily and Sardinia providing outposts of Axis air power and stepping-stones across the Mediterranean

Spanish troops on parade.

for Axis land forces and supplies. With no enemy and not even a neutral either in Italy or along the whole northern coast of the Mediterranean, the strategic situation would be transformed. In such circumstances, and allowing for the fact that in another war much more formidable weapons would be encountered than in the two years from the summer of 1940 to that of 1942—the period of "the steeplechase to Benghasi and back"—there would not be infinitely better prospect of making the best strategic use of the Mediterranean. From the point of view of defense there is hardly a single consideration more vital. The strategic importance of Spain must be rated above its economic importance, though the latter has been acknowledged and the former not.

I have put the pros and cons of the matter as fairly as I can and if it is apparent that I favor one course of action rather than the other, that is because, in all sincerity, I am unable to find as good a case for one as for the other. As I have pointed out, the strategic arguments are overwhelmingly in favor of the admission of Spain to Western European comity.

The time seems to have come when British and American statesmen must make up their minds and when the present degree of caution displayed by them will soon be synonymous with timidity. There can be little doubt as to the counsel they receive from their professional advisers and not much as to the course which their judgment would lead them to follow, were it not for the complication of ideological strategy. This may be an important factor, but there are others in the world today which must be considered very much more so.

Higher Command of the Armed Forces

Digested by the MILITARY REVIEW from an article by Air Vice-Marshal E. J. Kingston-McCloughry, in the "Journal of the Royal United Service Institution" (Great Britain) May 1948.

WORLD War II brought us face to face with numerous unforeseen urgent and dominating problems in the organization of the High Command of the armed forces.

Conceptions of High Command and of combined and joint operations which had hitherto in general depended on liaison and goodwill amongst Navy and Army Commanders in Chief—British and Allied, gave place to a new conception: to a more positive approach to the problems of High Command.

For a number of reasons no standard organization was adopted for the High Command in the various operational theaters in the late war. Indeed, any such attempt might possibly have been premature and even disastrous. Nevertheless, from the lessons of practical experience and under pressure of the logic of events there did in fact crystallize a recognizable pattern of High Command resting upon generally valid principles. The object of this article is to describe that pattern and show how the underlying principles are illustrated by it.

Undoubtedly, one of the most far-reaching lessons of the late war is that, despite the increasing mechanization of the instruments of war, the human agency is still of ultimate importance. One important feature of all high command organizations was that the duties of any high office, although clearly defined in theory, could be discharged in as many different ways as there are different types of per-

sonality. Therefore, a lesson to be learned is that in deciding a system of high command and in defining the duties of the posts within it, it must be realized that each high post requires a certain type of personality to make the system function as originally conceived. There is a great deal to be done with regard to research concerning the type of personality most suitable for each appointment in a system of high command.

Paramount Command

The Prime Minister as head of the War Cabinet is in fact the paramount commander of our armed forces. The term "Command" is not, it is true, usually applied to the ultimate political direction of war; nevertheless, the war effort of a nation is, or should be, the expression of a single will and intention working itself out in practice, and it is a healthy reminder of this fact that the same terms should be applied to every stage in the transmission of that intention, from top to bottom.

The Prime Minister also has scientific and civil authorities who act as his staff in these aspects of war. It is the War Cabinet's responsibility to coordinate the military, scientific and civil aspects of war. Experience of World War II indicates, however, that some improvement is required to the existing coordinating machinery, especially as the tendency is for the military and civil aspects of war to become more and more competitive.

Where Allies are concerned, the paramount command is the allied political heads in combination.

As Chief Staff Officers to the Prime Minister and War Cabinet, the Chiefs of Staff, using their three respective Ministries—Admiralty, War Office and Air Ministry, have three main functions:

1. They are the authority responsible for giving military advice to the War Cabinet on all aspects of the war effort and the armed forces.

2. They interpret the War Cabinet's intentions and act as its agent in communicating with subordinate commanders, amongst whom they are responsible for securing all necessary coordination.

3. They are also directly responsible, in respect to their own services, for raising, training, equipping and administering the armed forces, before these are allocated to the subordinate commands, and for the provision of those services which are provided from the center of the armed forces as a whole or from each of the three services.

Experience in the last war proved our pre-war paramount command with its staffs and secretariats to have been based on sound principles. Although subsequent developments were necessary, the pre-war organization was sufficiently flexible to permit growth and changes to take place without serious difficulty. After the United States entered the war, both governments agreed that the United Kingdom Chiefs of Staff and secretariat organization should be adopted for all Allied armed forces in the form of the Combined Chiefs of Staff with a secretariat in Washington, who stood in the same relation to the Allied political heads in combination as the Chiefs of Staff did to our Prime Minister.

Supreme Commander

When an intention has been formulated by the paramount command and the forces considered necessary for its execution have been assigned, it is thereafter necessary:

1. To interpret that intention in the light of developing circumstances, which may involve applying to the paramount command for further forces or instructions.

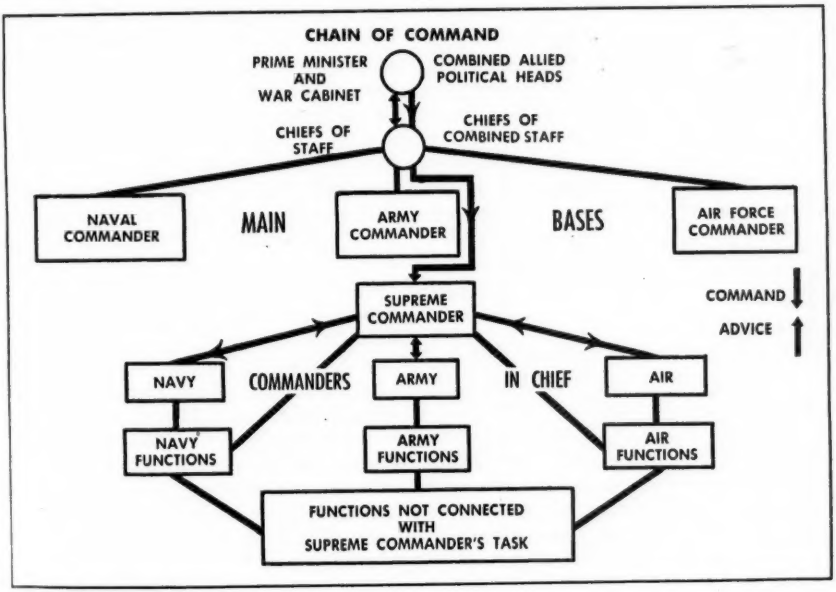
2. To assign tasks within that intention to the respective services, and to

insure the coordinated fulfilment of those tasks.

The paramount command cannot, of course, perform these functions itself; they must be performed "on the spot" by a mind giving undivided attention to the one specific object. It is equally axiomatic that these functions can best be performed by a single individual. The objections to two or more concurrent authorities interpreting the same directive or allocating tasks within it, are obvious. In the simplest case this single authority charged with executing a decision of the paramount command is either a supreme commander responsible to the War Cabinet and communicating with it through the Chiefs of Staff or, where Allies are involved, a supreme Allied commander responsible to the allied political heads and communicating with them through the Combined Chiefs of Staff.

The role of this single individual and the nature of his command are aptly covered by the American concepts of a "Task Force" and "Task Force Commander." In the last analysis he commands and controls not actual forces—fleets, armies, and air formations, but the functions of those forces which have been allocated or are necessary to the performance of the task with which he is charged.

A further occasion of complication may be when the supreme commander has a dual role. He may not only command as a whole the functions of the three services placed at his disposal by the paramount command, but may himself also be the effective commander of one of the three services. In principle such duplications may be regarded as undesirable since they must tend to distract the supreme commander from the pursuit of the single main object. In practice, convenience,



economy or personalities may often make such arrangements unavoidable, and when that is so, the more clearly the true nature of the duality is recognized, the less harm is likely to spring from it.

Attention must be drawn to a case in which the paramount command establishes an off-shoot of itself. It may be that interpretation "on the spot" of a directive of the paramount command involves not only military considerations, but also political decisions which are beyond the competence of a military supreme commander. It may also be that conflict or competition between two or more directives of the paramount command requires to be resolved or regulated without constant reference back to the source of authority. In these cases the paramount command establishes a kind of "outpost" in the theater of operations to exercise its own power by delegation, an institution which came during the late war to be known as the "Resident Ministers of State."

Relations with Commanders in Chief

Turning now to the relations between a Supreme Commander and his subordinate Service Commanders in Chief, the guiding principle is that advice must be as little as possible divorced from execution. In performing those duties of interpretation, allocation and coordination already described, the Supreme Commander needs detailed advice. The only ultimate guarantee for the trustworthiness and responsibility of this advice is that he who tenders it may have to execute the orders based upon it. The absence of such a guarantee has been the cause, on more than one occasion during the last war, of friction and even failure. The German (OKW) Combined Chiefs of Staff is an outstanding example of an organization set up to give advice without executive responsibility. The OKW is generally regarded as having been one of the most important factors leading to Germany's ultimate defeat.

In respect to a Supreme Commander, it is his Commanders in Chief who are charged with execution. Accordingly, the ultimate responsibility for advice regarding their respective Services must rest with the Commanders in Chief. It follows that if, in one sense, the Commanders in Chief are the Supreme Commander's staff officers, their staffs are also, to that extent, his staffs; and this is recognized in the formation of Joint Staffs, such as Joint Planning Staffs, composed of officers who have each an integral position in the staff of their own Commander in Chief. The Supreme Commander's own staff will then be in reality a secretariat rather than a staff, except in so far as they deal with those forces or functions which the Supreme Commander controls directly and not through one of the commanders in chief.

It will be observed that the relationship between the chiefs of staff and the War Cabinet represents a breach of the principle that advice and execution should be associated as closely as possible. In part the breach is apparent only, because much of the advice tendered by the chiefs of staff relates to matters preceding the establishment of this or that supreme command, and the allocation of forces and issue of a directive to it. In part, however, the breach is also a real one, inevitable owing to reasons of time and space. If the supreme commanders in the various theaters could be located in the proximity of the paramount command, they would automatically become its principal advisers, for the purposes of their respective commands. The same phenomenon reappears within a supreme command wherever the Supreme Commander is separated by long or difficult communications from the places where the main headquarters of one or more of his Commanders in Chief must necessarily be located. When

this is the case, the tendency cannot be resisted for the Supreme Commander to build up his own staff to afford him advice on matters concerning the Service with whose Commander in Chief he is not in intimate contact.

A Supreme Commander must necessarily have his own staff in respect to the forces and functions which he controls directly, though these forces and functions should be kept to a minimum. Only where the advantages are indisputable should this organization be adopted. In all other cases, direct control should remain with the Commanders in Chief concerned, with the responsibility of the Supreme Commander limited to policy and to coordination. Doubtful cases should at first be left under the direct control of the Commanders in Chief in order to avoid running any risk that functions and services once transferred may, as a result of further experience, require later to be transferred back. The principal scope for centralized control under the Supreme Commander probably lies in the fields of specialized intelligence, propaganda and publicity, and certain administrative services.

The command of Allied forces introduces complications of two main kinds. In the first place, the identity of aims and intentions at the top in the combined paramount command may be imperfect, with the result that the paramount command of each Ally attempts to keep separate control of its own national forces under a Supreme Commander. One consequence of this may be the appointment of a so-called "Deputy Supreme Commander," who in fact is often not a deputy at all, but intended by the nation which appoints him to be a check and control upon the Supreme Commander. The second course of complication is that, where Allied contingents of the same Service are placed under the same Supreme Commander, differences of organization, jealousies or other causes may prevent their subordination to one Commander in Chief, so that the Supreme Commander has to deal directly with two Commanders for the same Service.

Major Commands in World War II

It is now proposed to review the major commands which functioned in World War II, treating them as illustrations of the different forms in which the basic structure of high command, and especially inter-Allied high command, may manifest itself.

The Middle East. This high command falls within the classification of a main base. There was at first no single specific intention of the paramount command and thus no Supreme Commander was appointed. The Middle East also illustrates the paramount command "outpost" in the form of a Resident Minister of State which was created because of the political circumstances and the several different intentions.

This high command was organized as a Joint Headquarters with three Commanders in Chief of equal status responsible respectively for the Navy, Army and Air Force. There were no Allies to complicate things, and there were no special location or communication problems.

When the paramount command formulated the specific intention of clearing North Africa of the enemy, specific Allied forces were assigned for the task, and a Supreme Allied Commander was appointed. In fact, due to political considerations in North Africa, the Supreme Allied Commander was given the right of direct access to the British and U.S. Chiefs of Staff respectively. For the initial landings, the United Kingdom and the U.S. were the main bases and these, of course, were not placed under the Supreme Allied Commander. A notable feature of the administrative organization was that each Ally retained its own system of maintenence and supply.

A peculiarity of this high command was that the Supreme Allied Commander was also the Commander in Chief of the land

forces because he had to coordinate two Allied land Commanders in Chief. This resulted in the Supreme Allied Commander having a greatly swollen staff, predominantly Army, and this involved him in unnecessary Army detail.

Certainly, the successful working of this high command was the result of personalities—in particular General Eisenhower and Lord Tedder.

South-East Asia. When the paramount command formulated the intention to recapture Singapore, as for North Africa, specific Allied task forces were assigned, and a Supreme Allied Commander appointed.

The main base serving the Task Force was India; but this base was also serving other forces and was kept under a separate high command, except in respect of the air forces where, for special reasons, some aspects of the base were placed under the Supreme Allied Commander.

Some of the naval and air forces had roles additional to supporting the Task Force and were not placed under the Supreme Allied Commander in respect to these roles.

The Supreme Allied Headquarters contained elements of all three Services, and the Supreme Allied Commander was responsible to the Combined Chiefs of Staff through the British Chief of Staff. This arrangement was made because South-East Asia lay within the region of British strategic responsibility where the British Commanders in Chief were the executive agents for implementing the Allied intention.

Under the Supreme Allied Commander, three Commanders in Chief, each with his separate headquarters, commanded respectively the naval, army and air forces. British forces predominated over American forces, but smooth working of the high command was made more difficult by the U.S. land Commander in Chief being given the dual role of Deputy Supreme Allied Commander. The particular complications were that the American land forces were not themselves under the Army Commander in Chief and also that the U.S. land Commander in Chief had dual responsibilities in fields beyond the purview of the Supreme Allied Commander.

Another complication was that geography and communications made inter-accessibility of the various headquarters difficult. After some not very successful planning on the part of the Supreme Allied Commander's integrated staff, changes were made whereby all planning was transferred to members of the three Commanders in Chief staffs. This new arrangement worked most successfully.

Perhaps the most unsatisfactory aspect of this high command was the growth of a very large and unwieldy supreme headquarters staff, especially on the administrative side, to deal not only with policy and general plans, but also with detail.

Invasion of Europe. When the paramount command formulated the intention to invade Western Europe, a Supreme Allied Headquarters was created with a Supreme Allied Commander responsible to the Combined Chiefs of Staff, but with the right of direct access to the British and American Chief of Staff separately. The provision for this direct access was due to the planned preponderance of U.S. forces in North-West Europe.

An Allied Naval Commander in Chief and Air Commander in Chief (except for the final phase) directly responsible to the Supreme Allied Commander for naval support and amphibious operations, and for air support, respectively, were created each with his separate headquarters. Although Field-Marshal Montgomery was appointed to coordinate OVERLORD planning and to execute the initial assaults, no specific and permanent land Commander in Chief was appointed, and this command was not integrated below Supreme Headquarters. As a result of this arrangement,

a number of complications followed. For one thing, whereas a large staff of army officers was formed in the Supreme Headquarters, it did not contain any naval or air element, except in a very minor way for intelligence. This resulted in an unbalanced chain of command because the naval and air forces had one more link than the army organization. Furthermore, during the period when Field-Marshal Montgomery was coordinating the Allied land forces, his headquarters was temporarily raised to the level of those of the Naval and Air Commanders in Chief which, in turn, gave rise to other difficulties in the chain of command.

A further complication was the high command of the strategic bombers. The highest level of U.S. authority urged the placing of all heavy bombers based in the British Isles and the Mediterranean under the Supreme Allied Commander for both the preparation and execution of OVERLORD. The United Kingdom authorities, however, were reluctant to agree to this because they maintained that these forces had the additional dual role of the strategic bombing of Germany. Later, however, it was decided to give the Supreme Allied Commander control of the heavy bombers for a limited period immediately before and after D-day. In actual practice, owing to the personalities concerned, the Supreme Allied Commander's use of the heavies was effected by a very loose arrangement.

Geographical and communicational factors which affected the locations of the various headquarters caused great difficulty in planning, coordination and cooperation.

As in South-East Asia, this Supreme Command also failed to resist the very great pressure of setting up a large and unwieldy staff, especially on the administrative side, to deal not only with policy but also with detail.

On the basis that the Supreme Commander exercises command through three Service Commanders in Chief and is himself concerned mainly with the general planning and allocation of his forces and materials, and only to the smallest possible extent with detailed administration or tactical decisions, his headquarters should consist of three elements:

1. Joint Committees drawn from the headquarters of the Services Commanders in Chief. The essential features of these committees are:

a. The officers forming the Joint Staffs remain on the staff of their own Service headquarters.

b. At the lowest levels, members of the Joint Staffs from each Service headquarters work together in one room and thus form joint teams which insure that an inter-Service view is presented.

c. On the higher levels the Joint Staffs are composed of officers drawn from each Service headquarters who meet together in committee to discuss the problems for which they are collectively responsible. This insures that at the higher levels members of the Joint Staffs are closely in touch with realities and that the views of each Service are adequately and directly represented.

d. Major matters come for ultimate decision to a committee of the three Commanders in Chief with the Supreme Commander as Chairman when he wishes to be present.

2. A secretariat on the lines of the War Cabinet Secretariat in Whitehall. This secretariat would be composed of selected naval, army and air force officers and would be headed by a selected senior officer. In addition to performing normal secretarial functions for the Supreme Commander and Joint Staffs, it would provide the machinery for disseminating his views and requirements to the appropriate quarters and would have the special responsibility of keeping the Supreme Commander fully informed on all current matters. The essential difference between a

secretariat and a staff is that, whereas a staff could make decisions in the name of the Supreme Commander, a secretariat would not have this executive power.

3. An Inter-Service Staff to deal only with those matters which are under the direct executive control of the Supreme Commander.

The senior staff officer of the Supreme Headquarters should be Chief of the Joint Staffs. In addition, there should be a Principal Administrative Officer responsible for the work of that part of the Joint Staffs which deals with administrative matters and to act as Chairman of the Principal Administrative Officer's Committee. He would require a small staff.

In peace there are no military "tasks" or objectives in the same sense as in war. Consequently the need for supreme commands, still less for Allied supreme commands, does not make itself felt, and the basic structure of command is then geographical and largely separate for each Service, like the base command in war. In two respects, however, objectives in peacetime do exist, and have, or should have, important implications. First, there is the general "peace aim" of readiness for national defense. The unitary command which this implies at the top (and only at the top) has now been recognized even more explicitly than in the Cabinet and the Defense Committee by the creation of a Minister of Defense as a permanent peacetime office. Metaphorically, the Minister of Defense, as representative of one function of the Prime Minister, is the paramount commander of a future war, though exercising—simply because that war is future—only the coordinating functions and not the executive functions of that role. Again, in an exercise, there is always a "war aim," even in peace, albeit a pretended one. It follows that where the functions of more than one Service are concerned in an exercise, a supreme commander and his staff should be consciously set up and the opportunity taken of studying the problems of high command in practice and of indoctrinating future senior commanders with the principles of high command, so that when war comes this may no longer be, as in the past, an unexplored field, and consequently the happy hunting-ground of experiment and improvisation.

Zhukovski Academy of Military Aviation Technique

Translated and digested by the MILITARY REVIEW from an article in "Skrzydlata Polska" (Poland) February 1948.

THE Zhukovski Academy of Military Aviation Technique is the most important academy in the Soviet Union for the instruction of engineers and flying personnel in the theories of aviation.

The academy was organized as the Engineering Institute of the Red Air Fleet, immediately after the "October Revolution." The first director of the institute was the aviation expert, Prof. Zhukovski. He laid the foundation for the scientific work of the school and completed the staff of lecturers and workers, principally from among his former pupils. Prof. Zhukovski died in 1921.

In 1922, government authorities decided to transform the institute into a military academy. The new academy was given an efficient organization; work was facilitated by a clean-cut designation of tasks.

The first years of the academy's existence were a period of intensive creative labor on the part of the staff. It was necessary to develop methods of instruction.

During this period, the science of aviation was only in its initial stage of de-

velopment. In preparing manuals for the academy, it was often necessary to work out entire sections for the first time.

One striking feature of the main part of the work of the academy has been its close connection with the practical side of aviation as well as with the creation of the Soviet Air Force. In these matters, the academy has held strictly to the traditions of Prof. Zhukovski. Also in conformity with these traditions, the alumni of the school have taken an active part in the work of the various departments. Construction and invention have been characteristic of the school.

The students have been glider enthusiasts from the beginning. In many contests, a half-score of gliders, entirely designed and built by the students, have represented the school. These gliders have made many records, both interassociation and international.

Later, the academy began to occupy itself with the problems of airplane construction. This was the beginning of a creative period which later, because of special capacity, was characterized by independent and original construction work. The academy is able to boast of the training of many able designers who have given the Soviet Union many fine military aircraft.

The academy has taken an active part in the solution of theoretical problems, has conducted laboratory research, has cooperated in the construction of various types of aircraft and aviation equipment such as planes, autogyros, propellers, etc.

In all departments, studies are made of the construction problems and equipment in the most modern special laboratories. The basic equipment of these laboratories is individual. It has been necessary for the academy itself to design and construct it. Likewise, the creation of the main laboratories (aerodynamic, engine, aviation technology, flight research, ballistics, special electric, radio, piloting instrument and others) called for a great deal of construction work and ingenuity on the part of the faculty.

Nowadays the academy has at its disposal well equipped laboratories, which carry on a broad range of work in the field of scientific research and work out problems of great importance to Soviet aviation and the aviation industries. They are constantly perfected and rapidly adapted to the new requirements of an amazingly developing aviation.

Assembling experienced constructors made it possible for the academy to create a large amount of new and complicated apparatus during the course of the last war. For example, the aerodynamic department constructed four new wind tunnels.

The academy is today gathering together a faculty of prominent scientists. Thanks to their labor and the utilization of the laboratory facilities, this school has been able to accomplish the important task of preparing an adequate number of highly qualified specialists for Soviet aviation.

Action and Counteraction in Battle

Translated and digested by the MILITARY REVIEW from an article by Colonel K. Gyllenstierna in "Ny Militär Tydskrift" (Sweden) No. 4, 1948.

As long as a weapon is capable of operating and is used by a soldier who is capable of engaging in combat, it is a combat means to be reckoned with. The very moment, however, that the weapon or soldier, because of counteraction, is rendered incapable of action, the weapon becomes more or less worthless as such. In combat a certain relationship exists between weapon action and counteraction

which, under certain conditions, is able rapidly to increase the existing difference in combat capacity. In order to understand the essential nature of the effect if weapons, it is first of all necessary to familiarize one's self with this problem.

In the case of organized combat, it is necessary to distinguish between locally acting weapons and those which are not in the same degree bound by distance and local terrain. To the first category, we must assign the infantry's combat means; to the second, those of the field artillery.

If one desires to examine the problem still further, one may differentiate between three main types of combat means, each with fairly distinct missions, namely: infantry weapons, field artillery direct support and reinforcing battalions, and finally, field artillery used as artillery-counterbattery battalions.

The infantry of both sides, with its combat means, fights principally against the enemy infantry and is equipped for direct counteraction. Support and reinforcing artillery battalions combat, principally, the enemy infantry by destroying its protection, seeking thereby to reduce its fire effects without excessive exposure to counteraction. The counterbattery battalions on both sides attempt to hinder or interfere with one another in their task of preventing the support and reinforcing battalions from laying their fire down on the infantry, thereby attracting direct counteraction.

Regardless of the state of morale of the two adversaries and their tactical leadership, it is possible that the decision may be won by one or the other because of relatively minor circumstances.

We may, for example, imagine two forces of which A is the attacking and B the defending force. They consist, in the main, of forces equally suited respectively for offense and defense in the terrain in question, but the artillery of force A has a more suitable and flexibly working intelligence and observation organization than the corresponding artillery of force B. The outcome of this contest for victory or defeat may undeniably be determined by the artillery of force A.

This conclusion does not, perhaps, sound so remarkable, since the hypothesis was that both forces were in all other ways of equal strength, but we shall immediately see how force A's superiority of intelligence organization operates and gradually leads to superiority for its infantry.

Since the artillery of force A can be used in a better way that that of force B, all the artillery of the latter force will sooner or later be silenced—at least soon after it opens fire. The inevitable consequence of this will be that the infantry of force B cannot be regarded as adequately supported as it faces the infantry weapons of force A, and sooner or later it will be forced to bear the entire weight of the enemy's concentrated artillery fire, while the infantry of force A more or less escapes exposure to such fire. Hence, the balance, which hypothetically existed between the combat capacity of the two forces, must rapidly swing over to one side and the battle is decided in favor of force A.

We see that the seemingly unimportant advantage which force A had over force B, owing to the fact that the former's artillery possessed better intelligence and observation organization than the latter's, is gradually increased and results in definite superiority in favor of force A.

A small cause may be followed by great results, and this truth has a significant application in the case of weapon effects and strength of the counteraction that can be provided, because weak counteraction can rapidly lead to disaster.

When one considers this problem more closely, it is seen that access to artillery capable of effective counterbattery work is a much more important matter than it appears to be at first. It is a matter which concerns the higher combat

command and infantry to at least as great an extent as the artillery.

This lack of understanding of and interest in the significance of counterbattery work and the problems connected with it is, however, quite explainable and can quickly be altered. In field service exercises, and even in field exercises, the contact between the infantry and artillery seldom extends farther than the supporting artillery and its fire-direction patrols, with which the infantry's contact, as a rule, is likely to be satisfactory. But the counterbattery artillery is neither seen nor heard of. The character of the artillery is, moreover, such that it draws no attention to itself as long as guns are not speaking or shells bursting overhead. This is particularly the case with long-range artillery, whose battery positions are frequently far to the rear and targets far ahead. Knowledge concerning it may, therefore, be regarded as existing in a corresponding measure. Knowledge of counterbattery work, its objectives and means, and its results, which play so intimate a part in the life of the individual soldier in the field, are even today largely unknown to him and many of his chiefs. It would, therefore, be of great advantage, if at least our military opinion could bring about an understanding of the importance of counterbattery work and the consequences of regarding it as relatively unimportant. The awakening, which otherwise may someday occur, will be unpleasant.

In the armies of the countries which took part in World War II, these ideas appear to have been given consideration. Heavy artillery, especially fitted and intended for counterbattery work, appears now to enter into the organization of all artillery. It has even been asserted that effective artillery counterbattery work requires a strength relationship of three to one, which would mean, generally, that a battalion can be engaged against a battery. When these or comparable strength relationships cannot be attained, the artillery tactics must be based on a very delicate balance between fire, mobility, and fire-prohibition, until the decisive balance has been found. This type of tactics has little likelihood of becoming popular, but necessity knows no law.

For the execution of an artillery counterbattery mission not only is a long-range formation of sufficient magnitude required, but effective intelligence and observation organizations which will be able to locate the position of the targets, which are usually to the rear. Along with sound-ranging formations, ground observation detachments, and radar, artillery observation aviation are invaluable. Well-organized artillery-observation aviation will, therefore, be an important prerequisite for conducting effective artillery counterbattery work.

The author has tried briefly to direct attention to the connection between weapon effects and countereffects and their consequences, with especial reference to the influence of artillery counterbattery work. Lack of suitable combat means and organizations, under unfavorable conditions, results in unexpected and disastrous consequences. When we are concerned with weapons and their employment, incapacity or inadequate counteraction leads, as a rule, to superiority on one side.

It must be emphasized that within certain limits inferiority in matériel can be more than compensated for by superiority in morale and skill in the use of combat equipment. This may, for example, be effected by means of an operational engagement of combat forces in such a manner that the enemy will not have an opportunity to make use of his superiority in weapons. But in the final analysis it is the weapons, and the men back of them, which determine the outcome. Therefore, not only skilled men, but good weapons and the necessary means and organization for their proper use are required.

The Battle for Stalingrad

Translated and digested by the MILITARY REVIEW from an article by General Petit in "L'Armée Française" (France) April 1948.

A CAREFUL study of the operations in Russia during the last war reveals that at the time of the German attack in June 1941, the Russian Army was not completely prepared. Russian industry and transportation facilities could not satisfy the Armies' needs in repelling the powerful offensive operations of the German forces, which were also augmented by divisions from satellite countries, and backed up by the material resources of nearly all of Western Europe.

The Russian Government found it necessary to gain time in order to get war industry and transportation under way.

The country held on in 1941 and 1942, in spite of setbacks and reverses, until the offensive army, which defeated the German Army from Stalingrad to Berlin, was ready.

The German Offensive of 1941

When the Germans launched a new *blitzkrieg* on 22 June 1941, this time against Russia, everything seemed to be in favor of the German Army. It not only had great numerical superiority, but also numerous communication lines, vast quantities of war material, means of transportation and fuel taken from all the vanquished countries. It enjoyed the enormous advantage of surprise. It launched the attack with the assurance of a rapid and total victory which would make the Germans masters of the world.

The most important of the frontier battles took place in the Balostok-Minsk region over a depth of two hundred kilometers, and lasted about three weeks. It was supposed to open the traditional route to Moscow, by the Vitebsk-Orsha breakthrough, between the Dvina and the Dnieper.

The German Army reached its objectives about the middle of July. But the Soviet troops maneuvered skillfully while in retreat, being willing to sacrifice themselves wherever necessary in order to engage the German Army and exhaust it. The Russians were far from being destroyed and the outcome of the campaign was no more decided than on the first day.

The German command immediately undertook the second phase of the operations. The objective was to seize the lateral road Vitebsk-Mogilev-Gomel-Kiev which, on the east, bordered the Pripet Marsh, the Berezina and the Dnieper, and to head toward Leningrad on the north, Moscow in the center, and the shores of the Black Sea on the south. By the end of September, von Loeb on the north had reached the southern shore of Lake Ladoga, to the east of Leningrad. In the center, von Bock had progressed with difficulty toward Moscow. In the south, von Runstedt had reached the outskirts of Karkov and the Isthmus of Perekop at the entrance to the Crimea.

By that time, the two German wings on the north and the south had definitely advanced deeply into the heart of the country, but the Russian troops which defended Moscow were intact and had checked the German advance.

The Moscow Offensive in Late 1941

However, the Germans were late according to their plan and the Russian Army was not yet defeated. The *blitzkrieg* failed, and although the German Army did not suffer a military defeat, it did suffer a heavy moral setback. Hitler wanted to end the war before the severe Russian winter set in, for his armies were not prepared for a winter campaign. On 2 October, he launched the battle for Moscow declaring that "the conditions are at last right for striking a decisive blow which before the beginning of winter should end with the annihilation of the enemy."

From the 2d to the 16th of October, the Germans advanced with heavy losses and reached the Kalinin-Volokolamsk-Fominsk-Tula line. But at the same time, the Russian effort was increased. Militia and armed workers of Moscow went into action. 250,000 volunteers, both men and women, erected trenches and pill-boxes on the outskirts of the city. Their efforts met with success, for on 20 October, German progress was stopped.

During the next month, both sides prepared for a new battle. The temperature, which had remained pleasant, favored the preparations of the German command, who brought up divisions enough to give it a numerical superiority of almost three to one.

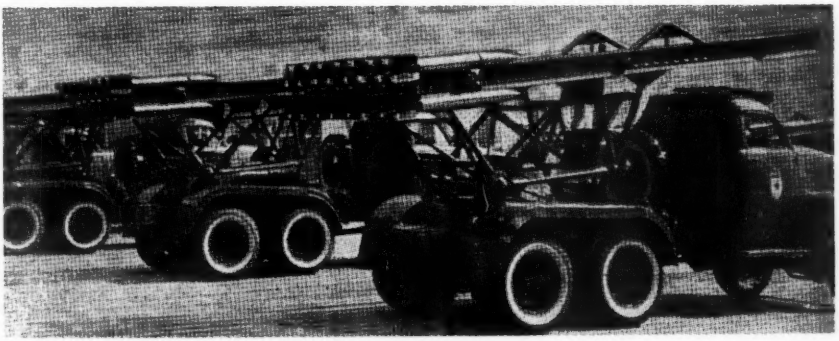
On 16 November, the German divisions launched their attack. On the north and on the south, in spite of severe losses, they reached the outskirts of Dmitrov, seventy kilometers to the north of Moscow, and the Oka River, eighty kilometers to the south of the Capital by the end of the month. But, in the center, the resistance of the Joukov army soon broke the impetus of the German advance which stopped exhausted before Moscow.

The German setback was definite; it was agonizing for the German command, because time was running out, and it was not able to avoid the winter campaign for which it was not prepared.

The Soviet Winter Offensive

The Soviet command was able to instruct, arm and bring up new divisions in the time gained by this repulse of the German attack.

On 5 December, it launched a counter-offensive. The temperature had gone down considerably; the German soldiers were worn out, badly dressed, shivering with cold, and incapable of resisting. At first they drew back slowly, then hurriedly. They were thrown back 200 kilometers from Moscow, beyond the line of Rzhev-Viazma-Briansk.



A group of Guard mortars. The "Katioucha" appeared on the battlefield for the first time during the Soviet counteroffensive in 1941.

For the German Armies and nation, this was a bitter setback. It was the first definite failure of the *blitzkrieg*; the myth of the "infallible *Führer* and of the invincible German Army" no longer existed.

The German Army, in spite of its heavy losses, still maintained a large numerical superiority in men and matériel. While

it no longer had the resources of men and lacked the raw materials for its war industry, the Soviet Army, on the other hand, reinforced itself continually both in men and material. Soviet morale was still high, insensitive to misfortunes, while German morale was seriously hit; the German soldier no longer believed blindly in the all-mightiness of the German armies.

The latter part of the 1941-1942 winter was used by both opponents to re-establish their forces for the forthcoming battles of 1942.

German Offensive Toward Stalingrad

The plan of the German command called for a new offensive, whose principal object was the encirclement and the taking of Moscow by means of an envelopment from the south. The attack in the center was to be directed toward Stalingrad and afterwards was to go up the Volga. It was to be flanked on the north by an attack through Voronezh and Tambov, in order to outflank the immediate defense of Moscow, and on the south by an attack on Rostov, the Kuban and Baku which was to deprive the Soviet Army of the food supplies of the Kuban and of the gasoline and oil from the Caucasus.

Harassing operations led by Marshal Timoschenko in May 1942 caused the German command to modify the initial distribution of its divisions and to set back the date of the launching of its offensive.

The latter finally got underway on 26 June 1942. On the north, it was stopped at Voronezh, which became a strong point of the Soviet defense; the German attacks were broken up and resulted in large German losses.

On the south, the Germans succeeded in invading the fertile region of the Kuban but at Grozny and at Ordzhonikidze they encountered two more strong points which they could not overcome.

In the center, where the main German effort was directed at Stalingrad, they attacked the Sixty-Second Russian Army, which drew back very slowly.

The Battle for Stalingrad

The importance of Stalingrad was realized by both adversaries. While Marshal Stalin decided on 12 July to create the "Stalingrad front," charged with holding the threatened city at all costs, Hitler reinforced the attacking troops and increased to fifty the number of the divisions which were to take Stalingrad.

Due to their numerical superiority, the German forces succeeded in advancing, but very slowly. On 17 August, they crossed the bend of the Don, sixty kilometers west of Stalingrad; on 4 September the city was cut off on the west and on the south; on 12 September, it was cut off on the north by the establishment of a sixty kilometer barrier between the Don and the Volga. Two days later, on 14 September, German troops reached the suburbs of the city itself.

At that point the furious battle for the city began. It was mostly hand to hand combat, while planes filled the sky constantly. The mass bombing created an atmosphere in which the ground fighters no longer had any human aspect; they fought foot by foot, house by house, story by story in each house. The workers in the factories worked with their weapons at their side; if the Germans drew near, they helped repel the attack and afterwards went back again to their work. In spite of some costly success on the part of the Germans, Stalingrad held.

While the Germans were being stopped at Stalingrad in spite of their repeated attacks, as well as at Voronezh, Grozny and Ordzhonikidze, the Russians were bringing up large forces of reserves. A plan had been devised by the Soviet High Command for the liberation of the city, and also for crushing the divisions which the Germans had massed before Stalingrad, thus definitely reversing the balance of forces.

The Soviet units were brought up in spite of German air vigilance. After crossing the Volga at night, they attacked the Germans, catching them unprepared for combat in the winter conditions of that region.

The Counter-Offensive

On 19 November the Russian counter-offensive was launched, with the goal of encircling and destroying the German Army at Stalingrad, commanded by von Paulus.

The Sixty-Second Army of General Tchoikov was directed to hold the Germans before the remains of the city.

On the north, Marshal Voronov, who commanded the entire Southwestern Front, attacked toward the south; he immediately broke the German lines and reached the railway of Rostov-Stalingrad the same day.

On the south, General Leremenko attacked from the Krasnoarmeisk bridgehead and progressed rapidly in two columns toward the west and the southwest. Elements of the two armies soon met at Kalatch and thus accomplished the first encirclement.

Other columns, executing wider movements, made their junction on 30 November at Kourmoiarskaia, 130 kilometers southwest of Stalingrad, accomplishing a vast encirclement which enclosed an area of more than 1,500 square kilometers. The army of von Paulus was now caught in the pincers; all of the German efforts to break the circle of Russian fire cost dearly but turned out to be in vain. This army, which no longer could be supplied, except by air, nor released, was doomed to death or to capitulation.

On 2 February 1943, von Paulus considered himself defeated and surrendered with twenty-four generals, 2,500 officers and the remainder of his troops, while abandoning a considerable amount of war material.

A column of Soviet motorized antitank artillery heading for the front in May 1942.

Stalingrad cost the Germans more than 100 divisions, about 1,300,000 men killed or made prisoners.

The blow seriously affected the power of the German Army, for it no longer could replace the losses which it had suffered.

It was still capable of offering resistance, but it no longer had the power to carry out a new general offensive. The balance of forces was definitely tipped in favor of the USSR.

The Loss of Singapore—A Criticism

Digested by the MILITARY REVIEW from an article by Brigadier I. M. Stewart in "The Army Quarterly" (Great Britain) July 1948.

THE issue of the Dispatches on the Malayan Campaign of 1941-42 offers an opportunity (from an Army aspect) for a critical analysis of the causes of that disaster. It is of little use to know that planning was unrealistic, that training was inadequate or that tactics were wrong. It is why these things were so that matters. One thing is sure: the answer will not be found in Malaya. Conditions there were only the expression of the malady, not its cause. The same symptoms had already appeared in Norway, France, Greece and elsewhere. In every instance it required the practical test of war to demonstrate the remarkable falsity of British peacetime appreciations.

The Blame

It would be as well first to consider where the blame for the loss of Singapore lies. The fortress, its defense plan and the tactics to implement it were not just the conception of the war leaders on the spot. They had been pondered and decided by the Chiefs of Staff and the Cabinet and sifted by academic Staff College study over the previous fifteen years. Few in any rank actively disbelieved in the conclusions reached, though these were to be proved wrong in virtually every particular.

Again, it is not just a question of blaming "our leaders." In general there was a tendency for all ranks, sometimes up to brigade commanders, to be passive, just waiting to be led, in place of showing eager initiative in solving the new problems posed by jungle conditions.

It is necessary, too, to place Malaya in the right perspective compared with other episodes. With no tanks, virtually no Navy or Air Force, rough equality in manpower, but almost all of it without war experience, we were certainly soundly beaten.

It is a pity that Dispatches seem to concentrate on attempting to mitigate our disgrace rather than on bravely seeking out and acknowledging its causes. Emphasis is placed on the air and sea situations as reasons for the collapse. They certainly led to strategic defeat and thereby made the Army fight, which it would not otherwise have had to do. But with the relative strengths of the ground forces and with all the advantages which knowledge of the country and proximity to our bases should have given to us, there seems little reason why the Army, fighting alone, should not have been victorious—had it been good enough. The weight of the Jap air attack was in fact never sufficient to be a decisive factor in a land battle. For instance, on the morning after the Jap landing on Singapore Island, my unit moved by bus to the battle front without undue casualties in face of the full and unopposed Jap air effort. The Army, however, was not approaching the same quality as the Jap either in skill or in morale. It was a case of academic, uninspired, slow-thinking amateurs taking on realistic, enthusiastic, fast-moving professionals.

Training

All contests are in great measure decided in the training period, and war, particularly jungle warfare, is no exception. In the lack of realistic, ruthless training from general to private in all spheres, psychological, tactical and physical, lies the whole secret of our failure in Malaya. It led to unrealistic planning on the higher levels, false tactics at the lower levels and surprise for all by the conditions of war when it came.

The vital decision on the highest level resolved itself into a correct appreciation of the relative importance of certain factors during the preparatory period. Em-

phasis on any one automatically reacted adversely on the remainder. These factors were:

The construction of defenses.

The smooth running of the administrative machinery.

Expense.

Jungle training.

The latter was placed last instead of everything being sacrificed to it. Defeat thus became certain.

The tempo of training, though inadequate, was certainly not less than the conventional standard current in Britain and India. But to hold that what training was "possible" was done is questionable. What was "possible" was the battle-school standard of 1943 onwards. What was "done" was the Army standard of 1939-40. This standard put planning the theoretical first; realistic practice second. There consequently developed a lack of balance between planning and the means for implementing the plans. While plans, through being based on false premises, became divorced from reality, the means for implementing them, which in effect was the quality of the infantry, became entirely inadequate for carrying them out. These facts were never generally appreciated. The Staff College directed and dominated Army doctrine and standards before the war. This was its unduly academic outlook in action. To it must go a large share of the blame. There was nothing novel in the weaknesses which expressed themselves for they were those common to all planners, national or military, when not rigidly controlled by practical tests. Should nothing else be learned from Malaya it will be of incalculable value if the danger inherent in "the bright boys" school is scotched. However plausible their ideas, however slick the sales talk, such plans must never again be accepted until both they and the means for implementing them have been tested again and again under conditions approximating those of war.

Tactics

The devastating result of this situation was wrong tactics. The generally accepted illusion was that the jungle was impassable for large bodies of troops and that circumstances were thus overwhelmingly in favor of the defense. It was on this assumption that Singapore fortress had been designed. The jungle is certainly impassable for non-jungle-trained troops, but for those so trained it becomes the perfect medium for attack, for it offers a universal covered approach. In face of such troops the defense lacks all the factors essential to success—good field of fire for its automatic weapons, secure flanks and, above all, secure communications. For in the Malayan jungle, far more than in Burma, communications are usually concentrated into the life-line of a single road. Under these conditions a static defense has no hope of success. It will inevitably be walked round or infiltrated through, the road in rear cut and, in the absence of jungle-trained reserves to counterattack, the defense will surely disintegrate. In Malaya there are no positions such as at Bataan in the Philippines where the defense can have its flanks secure and compel frontal attack. It follows that against a jungle-trained enemy in the particular circumstances of Malaya there are only two alternatives, to attack or to delay by gradual withdrawal to avoid the encircling move. Static defense is certain death. Yet static defense was the basis of our strategy and of our tactics. The British plan would have been entirely effective against troops trained to British jungle standards; it was disastrous against a fully jungle-trained and already war-experienced enemy.

To attack successfully in jungle is admittedly a difficult operation requiring a different pattern of battle, different techniques and a far higher individual morale than in open country. Owing to lack of practical experience Higher Com-

manders and Staffs had no clear idea on how a jungle battle should be fought. Even some brigade commanders who had been there a year and more gained their first real experience of command in jungle in their opening battle. The requisite new techniques had not been evolved. Few units and fewer staff officers and senior commanders had any knowledge of the complex technique of the encircling attack, a standard jungle operation. The problem of fire support had not been solved. It was left to war to discover the adaptation and improvisation that was so necessary for the jungle.

In fact, the Army as a whole was incapable of offensive action—the Higher Commanders and Staffs of laying it on and the units of executing it. This made ultimate defeat certain, irrespective of how the campaign was handled or, within reason, of the relative numbers involved. Any criticism of the actual conduct of operations is therefore redundant.

It takes about six months fully to train and physically and emotionally to acclimatize troops to Malayan jungle. Had training been given priority, more than two and a half divisions instead of a few odd battalions could have been ready when war started. Due weight must, however, be given to the reasons advanced in the Dispatches for the state of training, particularly in the case of the Indian troops with their shortage of leaders. The training problem of the Higher Commanders was not easy. First they themselves had to break away from the preconceived and conventional Army ideas, a far easier thing to state than to achieve, for orthodoxy had been taught as a religion without regard to its dangers. There were also financial and administrative difficulties. Lastly, subordinates had in turn to be convinced and inspired.

A decisive weakness was the lack of a Director of Military Training of sufficiently high rank to evolve, dictate and teach the new techniques that were so urgently required. Higher Commanders were overwhelmed with planning and administration, and had no time for deep tactical study or instruction. In practice therefore there was no coordination of ideas or formulation of a common tactical doctrine for jungle. Units were in great measure left to evolve their own techniques and to teach themselves. As the great majority had specific defensive tasks, they quite naturally tended to concentrate on these static duties rather than on jungle mobility and jungle attack. This, combined with the views of the particular commanding officer, accounted for the marked difference in jungle quality between units, a difference that most emphatically did not correspond with lengths of stay in the country. Only a very few units, British, Australian or Indian, had reached the stage where the jungle was a friend instead of an enemy. They indeed had evolved tactical conceptions and techniques approximating closely to those of the Japs. These, however, remained private instead of becoming public property. It is of no excuse, though, for any of us to say "nobody trained us." There was ample opportunity for individuals and units to take the initiative and train themselves.

Quality of Manpower

Both critics and the Dispatches have argued in considerable measure on the basis of relative strengths in men and material, factors of far greater importance in open than in jungle war. For in jungle war it is the quality of the man far more than numbers or weapons that counts, his psychological, tactical and physical training, his morale, his discipline, his toughness. And when the man becomes the deciding factor, it is the infantry arm that decides the battle. Troops untrained to jungle are an encumbrance on the limited communications. In open country it may still be possible to walk forward partly trained units behind an

overwhelming barrage in the attack or to put them into a defensive position. But in a mobile jungle war there can be no heavy barrages; the demands on individual aggressiveness and tactical skill are therefore far greater and static defense is death. Quality in the infantry is therefore vital: it will counter almost incredible odds. This was amply demonstrated in the few exercises held in Malaya, above unit level, and later by the Japs in Burma. But the vogue of putting the infantry last in importance in our Army was still in force. Drafts initially selected from the bottom 50 per cent of Army intakes, milked of leader and specialist types before leaving England, were further picked over by Staff vultures in the reinforcement camps before being allowed to join their units. The result was that the deciding arm, the Infantry, was both second-class in man-quality and second-class in jungle training. It was a major factor in our defeat.

If the above arguments on quality are accepted, there are few grounds for contending that the arrival of more non-jungle trained reinforcements—the additional Australian Divisions ultimately diverted—would have influenced the result. It would only have meant more prisoners.

Antitank Defense

The use of tanks by the Japs has been quoted as a vital factor. It certainly was in several of the battles in which they were employed. It is contended, however, that this was solely due to their use coming as a surprise. There had been little study of antitank defense and in spite of the shortage of antitank guns little improvisation of means to combat them, a simple matter in the jungle war. There had been no improvised "battle inoculation" either of infantry or antitank gunners. The morale though not the material effect of Jap tanks was thus very great. Further, the coordination of the antitank defense, having never to my knowledge been practiced, frequently failed. My own unit on three occasions during the campaign had to meet Japanese medium tanks without any antitank support other than their antitank rifles. These, however, would not penetrate the Jap frontal armor. It is unquestionably true that the possession of medium tanks by the British would have greatly enhanced the difficulties of the Jap encircling attacks, for they could have been counter-attacked when debouching on to their objective of the road and when without heavy antitank weapons. But tanks in the absence of jungle-trained infantry could not have won victory, they could have only delayed defeat. In Malayan jungle it is too easy to stop tanks on their one avenue of attack—the road. Apart from tanks, the advantage of Army material lay with the British. The Jap fire support, except perhaps on the night of their attack on the island, was never sufficient to justify successful assault. The campaign was decided previously by infantry maneuver in which material played only a minor part. The unopposed Japanese air attacks had small material, but an increasingly and ultimately considerable moral effect on the Army as a whole. This effect remained negligible in the trained units for the attacks were not heavy by European standards, but when the conditions of war came as a surprise and morale was therefore already under strain, the added pressure from the air was important. Again, realistic training in peace was the deciding factor.

Morale

The Dispatches, in their consideration of the moral factor, seem to touch unduly lightly on its shortcomings. As will readily be appreciated, jungle war, with its isolation and absence of heavy covering fire, requires a far higher standard of individual morale than open warfare, where a man can experience the companion-

ship of the herd and the personal influence of his leaders. In these conditions, results can still be achieved with a passive type of morale, the type that is just good enough to prevent men running away. But in the jungle encircling attack is not possible without a morale that expresses itself in eager individual aggressiveness, and without the ability to conduct encircling attacks not only is it impossible to gain victory but it is impossible to avoid defeat. This form of morale was rare in Malaya. The Jap set such a fast tempo to the campaign that many were never able to recover their poise.

Until the Staff College teaches that every military operation requires a moral plan coordinated with the tactical and administrative plans at every level, and as deliberately framed, similar situations will recur. Periodically to reiterate that the moral is to the physical as three is to one is not enough. Morale in Malaya was left more or less to look after itself, but to no greater degree than was customary in the Army. It failed insofar that it was inadequate for jungle attack. In morale, as in tactical skill, the Jap was much superior.

One lesson was again demonstrated—that in training youth for war it is not comfort that inspires, it is a high tempo, achievement and toughness. For in those units that had trained and lived hard, morale persisted far longer.

German Artillery Concentrations

Digested by the MILITARY REVIEW from an article by Colonel A. G. Cole in "The Journal of the Royal Artillery" (Great Britain) July 1948.

SHORTLY before the German generals were repatriated in May 1948, Lieutenant General Sir Brian Horrocks had a query put to Lieutenant General Kurt Dittmar, by Captain Liddell Hart, as to why the Germans never seemed to put down really good concentrations such as we did. From his experience, neither in the Dunkirk period, in the Desert, nor in Northwest Europe, did we receive anything like what we put over.

General Dittmar's reply follows. It has been slightly edited as to the terms used, as requested by him, so the term Regiment is used for his Group and Divisional Artillery for his Regiment in order to make an easy comparison with British usage.

One lesson has a particular bearing on the future when we can no longer afford great build-ups of men, ammunition or supplies and that is the unanimous dictum of Generals Oriola and Viebig: "Where there is no ammunition there is no fire concentration."

Gen. Dittmar writes (in English) as follows:

"I was able to gather the opinions of several outstanding generals of the artillery (there are many gunners in this camp and it is, perhaps, of certain significance that the proportion of former gunners was higher than that of former infantrymen in occupying the higher—and highest—places in the German army both absolutely and still more relatively). I asked General Graf Oriola to give me his and the other men's views on your point. He has written an appreciation which has been completed by General Viebig with regard to particular experiences in the bat-

tle in Normandy where he was a division commander. Oriola himself had much front-line experience as a former artillery commander and then division commander on the Eastern Front. He writes as follows:

"'The idea of "concentration of fire" (*Feuerzusammenfassung*) founded on the experience of World War I was the main principle of the tactical and technical doctrine of the German artillery. It was the aim of the peacetime training and the dominating point of view during the war. This aim found its expression in the following ways, among others:

"'1. *Tactics.*

"'The smallest fire unit was *not* the battery but the regiment (*Abteilung*) which was the normal tactical and administrative unit. The use of single batteries was exceptional and was only employed when the type of target to be engaged (e.g., pin-point, harassing fire) allowed or demanded it. Concentration of fire dominated the training of the units. The means employed were maneuvers in fire direction, artillery map exercises and practical schemes on the training areas, mostly inside the framework of the divisional artillery (three light and one heavy regiment). The yearly practice camp culminated in several shoots with each divisional artillery as a whole. Moreover several shoots took place every year, guided by the Inspector of Artillery which embraced several divisional artilleries—up to thirty batteries. The Commander in Chief of the Army took part in almost every case. The main point of all these maneuvers was fire concentration.

"'2. *Technical.*

"'In order to achieve a quick concentration there were the following methods in use:

"'(a) Short, clear definition of target indication, e.g., reference points, map reference, grid reference, zero line, etc. (Oriloa names several more which are too technical to interpret.)

"'(b) Good means of communication—especially wireless. Every regiment and every battery had a "T-receiver" which was established solely to receive the orders of the divisional artillery for fire concentrations given by a 40-watt apparatus.

"'(c) Large scale maps for all levels of artillery commanders marked with the ranges and arcs of the batteries.'

"These principles governed the use of the German artillery during the war as they had already done before it. The breakthrough of the Maginot line, the crossing of the Rhine-Marne canal and of the River Aisne (Oriola mentions these examples from his own experience) would have been impossible without fire concentration in the largest sense of the expression.

"On the Eastern Front the fire concentration proved still more useful—and still more necessary—especially because there were far fewer aircraft for immediate intervention in the ground battle. Only in the running fights during the advance was the importance of fire concentration diminished but even here the artillery fire unit was based on the regiment and not on the single battery.

"Now comes a very interesting consequence. Since the frustration in Russia in the winter of 1941-42, the artillery became more and more the decisive factor in any successful defense. (Oriola mentioned here a lot of examples—all fighting where he took a leading part, first as the commander of a divisional artillery and then as an 'artillery commander' when his artillery was most used according to the needs of the moment and attached to one or another of the Army Corps.)

"He goes on: 'The reason for this rise of the artillery was the small number of infantry in comparison with the enormous frontage of the sectors to be defended (20-25 km. to each division). The fire concentration was, of course, not limited to the divisional artilleries but embraced

all types of additional artillery including heavy antiaircraft.

"'The artillery commander's main task was to provide the cooperation of the artillery of different divisions and to build up an overlapping fire concentration formed by the artillery—or parts of it—of more than one division.'

"Oriola gives an example of fire concentration in the attack: In the 1942 offensive against Voronesh it was possible to gather the fire of ten regiments (*Abteilung*) on a strongly defended sector of the Russian position, the width of which was about 800 meters, within twenty minutes—with the result that the infantry attack pushed through very quickly and very easily.

"He finished with the words, 'Fire concentration was the center of every gunner's thinking and acting till the end of the war.'

"Oriola tries to explain why British experience seemed to be as set out in the original question and says: 'The reasons for the failure of our artillery in the last part of the war were as follows:

"'(a) A terrible shortage of ammunition. As an example, in December 1944, the scale for each battery in the Ardennes battle was:

	Rounds per day	
	Light Field Howitzer	*Heavy Field Howitzer*
On quiet days	16	4
On fighting days	32	8'

"This shortage was due to the breakdown of manufacture and, still more, to the influence of Allied aircraft on every kind of supply. In Normandy, Viebig told me, it was still worse, and both Oriola and Viebig said, 'Where there is no ammunition there is no fire concentration.'

"'(b) A heavy shortage of technical means of communication especially of wireless, cable layers and every sort of repair facility. Reason: breakdown of manufacture.

"'(c) High losses of trained men and specialists for running the difficult means of communication. As no skilled and trained men were coming from the Home Army (I think because of the exaggerated number of new formations as well as through the heavy losses all round) the troops were compelled to train the communications personnel themselves—and mostly while fighting was in progress.

"'(d) A steady lowering of the artillery officers' qualities because the younger men were transferred to the infantry.

"'(e) The same lowering of standard with the senior officers took place. The older officers had to be given command of divisions, etc. Their artillery was commanded, partly at least, by reserve officers who were not officers by profession and had, naturally, much lower average knowledge and experience.'

"In short, the German army was overstrained and eviscerated in all its parts including, of course, the artillery too. Thus the Normandy battle is not a good foundation for making comparisons in any direction.

"As to the experience we had in Africa there is nobody here to explain the local circumstances. But I believe the reasons are the same as Oriola gave. The difficulties in maintaining supplies were still greater.

"I can outline, from my own experience as a division commander in Lapland, all that Oriola said about the high place given to fire concentrations. In every examination of the training processes fire concentration was the main point. It was the object of many competitions—in details as well as in actual shooting. In Lapland it was my best—often my only—means of keeping off the Russian counterattacks although it was rarely possible to apply during our attacks in the large woods through lack of maps and datum points. But even then we have tried and

carried it out over and over again. There was still a further handicap, completely unknown till then. When the Northern Lights were in the sky our wireless sets did not function.

"I would be very glad if this report could be given to the questioner in order to give him a better opinion of the German Artillery which, in my opinion, was much better in this war than in World War I."

Initiative in Taking Paris

Translated and digested by the MILITARY REVIEW from an article by Colonel de Guillebon in "Revue Historique de L'Armée" (France) No. 1, 1948.

AFTER the reduction of the Falaise pocket, the taking of Paris was imminent, and all the French authorities urged the Allied command to undertake the operation.

General Leclerc had repeatedly been promised that his division should take part in this action. On 16 August, he had again called General Patton's attention to this matter. On 19 August, relieved from contact by a British division, the 2d French Armored Division was ready to participate in the race to the Seine; but instead of leaving it with XV Corps, the Allied command assigned it to V Corps, which remained in the Argentan region.

General Laclerc became uneasy at the sight of the Allied armies approaching Paris, leaving him 200 kilometers in the rear. If the Allied command, in spite of their plans and their promises, were to suddenly begin the attack on Paris, would the French be in a position to take a hand? Of what use would it have been to have insisted over a period of ten months on landing in northern France if the only French division in the Allied army were absent during the battle of Paris?

On 20 August, General Laclerc decided to send a detachment to Paris secretly. If it did not enter ahead of the division, it could at least carry out reconnaissance which would be of help in the engagement of the main body of forces.

The force would have to pass the Allies unobserved, as they would not have permitted the movement of a large force. On the other hand, the force had to be sufficiently strong to overcome minor German resistance which it might encounter.

The detachment had to represent the French army to the Parisians in as worthy a manner as possible. This led the general to select old units of the Free French Forces and the standard of the 1st March Regiment of the Moroccoan Spahis.

Finally, as regards the division, discretion had to be used or the departure of the detachment would have aroused excitement, jeopardizing the secrecy of the event. It was kept so secret that even the chief of the 3d staff section himself was entirely ignorant of the whole affair and was able, the following day, to refute, in good faith, in the presence of the staff of the American Corps, the report of the detachment's presence in the Rambouillet area.

General Leclerc was well aware of the fact that his taking the initiative would become known, in the end, and would shock his American superiors. He notified General de Gaulle, by letter, of his intention, and made the following comment to the detachment commander:

"Now that no important mission is holding us in Normandy, I am doing all I am able to do, and after your departure I shall insist immediately on moving close to Paris. As you will understand, the Al-

lies must not enter Paris without the French army. That would be contrary to both the national and international meaning of the event.

"So move as rapidly as possible. If any unit whatever enters Paris, I wish for you to enter with it. I shall join you, but in the meantime, you are to exercise, in my place, toward the Allies as well as toward the French, the functions of military governor. If you are able to enter all alone, do not hesitate. Go ahead."

He knew nothing, at that time, of the Paris insurrection, but as the chief French officer he had all the reasons in the world for being in a hurry to liberate Paris.

The detachment left at noon of 21 August, and that evening stopped at Vaubrun near Nogent-le-Roi, from which three patrols left on reconnaissance the next morning, one in the direction of Houdain, another in the direction of Rambouillet, and the third in the direction of Étampes. They were to discover the best route for reaching Paris on the left side of the Seine.

Information obtained successively from civilians, the Americans, and by the detachment patrols, confirmed the report that the German resistance decreased from west to east. Consequently, the detachment went to Arpajon, north of the line which had been reached by the Americans, to spend the night.

The Allies now were crossing the Seine north and south of Paris, avoiding the capital, which had risen against the Germans. The Parisians told the detachment that there was no one between the gates and Arpajon, except one battery and a small strong point at Montlhery. So departure was fixed for 0630 the next morning to enter Paris, the order being to avoid the highway and to filter in through the innumerable approaches through the suburbs, going around German points of resistance.

The evening of 22 August, the detachment transmitted to the division by radio the main points of the information they had gathered, and reported their intention of entering Paris the following day through the Orleans gate. This message crossed with an order from the division to cover the division advance over the axis, Rambouillet-Versailles-Paris, establishing contact with the Germans on that route.

At that moment, it was known that the Versailles route was barred by the strong Trappes, Guyancourt, Villacoublay positions, while the Orleans route on which the detachment was then located was almost clear. A message to the general, with a request for an immediate reply, insisted that the detachment be permitted to enter Paris on the 23d; but stated, however, that if a reply were not received by 0700 in the morning, they should execute the last order from the division.

During this time, an officer who was too considerate to disturb the sleep of General Leclerc, had given him none of the detachment messages. Sick at heart, at 0700 on the 23d, the detachment left Arpajon for the Chevreuse region. Toward noon it lost a tank when contact was established at Trappes, while the remainder of the detachment seized possession of the barricades of the Dix Sept Tournants highway and came out on the Guyancourt plateau.

At 1600 at Rambouillet, the leader of the detachment saw General Leclerc who still did not have the information sent by the detachment. He immediately decided to modify the direction of his main effort, and to direct the Billotte group along the route which the detachment had discovered to be free from resistance.

Command and Supply

Translated and digested by the MILITARY REVIEW from an article by Major D. Mario A. Pozzi in "Revista Militär (Argentina) May 1948.

WORLD War II again emphasized what had been learned in World War I and had been included in regulations and directives of instruction for commanders: the importance of supply and its relationship to command.

Under various names, the art of supplying and maintaining the aggressive power of armies was the subject of study and consideration. But in many cases, we believe this study was misdirected, with the result that some persons concluded that *supply* was opposed to *command*, and vice versa.

Only those professionals who had a true interest in supply problems and were attracted by this new aspect in the art of warfare, studied them. They worked without aid or encouragement during the years of peace.

On the other hand, those engaged in the study of strategy, operations, and tactics overlooked the problems of supply without first considering their real importance. They claimed that any well-planned operation could be supported by a little more effort on the part of the rear echelons.

The original mistake of not combining command and supply probably gave rise to that unfavorable state of affairs which compelled these two fundamental aspects of the art of warfare to follow different lines. It was the result of lack of comprehension, cooperation, and mutual understanding.

This does not mean that no one understood the problem or made it known; there were some who did and who were very capable, but they were the exceptions.

Fortunately attitudes have now changed, and in contrast to previous misunderstandings and useless arguments there is a marked and enthusiastic interest which eventually will result in a new conception of the identity between the functions of command and logistics.

But there are some dangers that must be avoided. Supply matters must not be so overemphasized that they subordinate the needs of the command. In addition, there exist too many publications which discuss supply from a prejudiced viewpoint, thereby creating, or stimulating, distorted concepts and exaggerating the importance of supply instead of giving it its real relative value.

Anything done to prevent these pitfalls will be helpful in contributing to success in the preparations for a war.

A commander today must recognize the importance of supply, and in some instances supply factors will have definite influence on his decisions. But it should also be borne in mind that the importance of supply varies, and is related to various other factors.

Supply should be taken into consideration and coordinated with the other factors affecting the analysis of a situation, but care must be exercised so that it does not become a restriction on the judgment of the commander.

Preparing the Supply Plan

Experience has proved that estimates of the consumption of supplies usually fall short. On the other hand there will be occasions when availability of supplies, or their conservation, will facilitate the execution of operations.

There will be times, even when considering supply requirements in the analysis of the situation, when the commander will discover that in order to take advantage of the surprise factor he must make a decision which will not always be the wisest from the standpoint of supplies.

Therefore the supply factor falls within the analysis of the situation, and should

be considered in relation to all other factors and the general requirements which will determine in each case the relative importance the supply factor reserves.

Command and supply should be coordinated so that all chance of friction between them can be eliminated in advance and the planned operation successfully executed.

The commander must know what conditions are necessary for the efficient development of supply activities, and supply agencies should constantly strive not to restrict the operational capabilities of the command but to help them by allotting supplies so that the operations will be adequately supported.

The following examples will better illustrate the preceding principles.

In the early plans to open a second front by invading Europe, the Allied officers responsible for the supply plans decided that they would need a port of large capacity from the very beginning if they were to accomplish their mission. Such a port must be capable of efficient operation and be able to handle several ships at the same time.

But those charged with the planning for the landings and subsequent operations believed that the capture of a main port would involve such extraordinary efforts and heavy losses that it would not be possible to plan the operation unless more time and extensive means were available. In fact, as was expected, the main idea of the German defense was based on the fortification and reinforcement of all the important French ports, which made them very strong against attack.

Thus, any large scale Allied attack from the sea would have to count on very powerful forces capable of defeating the stubborn enemy harbor defenses. Even in case of success, an attack would be preceded by a relatively long period of action and loss of surprise.

Evidence of the defensive capabilities of the German occupied ports is the fact that, despite the success of Allied invasion forces, the principal ports of the continent resisted so long, even after most of them had been isolated and were far in the rear of the battle front. Thus Cherbourg, which the Allies expected to occupy by 14 June 1944, was not captured until the 26th; St. Malo, Brest, Lorient, St. Nazaire, Le Havre, Dieppe, etc., resisted beyond all expectations, and gave a good example of what it would have meant to General Eisenhower's forces if they had engaged in a direct attack against any of those ports to satisfy the desires of those in charge of supply.

The selection of the invasion zone gave rise to a controversial problem. On one hand, a large port was necessary in order to furnish logistic support; on the other, an analysis of operational and tactical requirements made evident the enormous difficulties involved in the capture of such a key objective.

Finally, the best solution was found by taking into account both circumstances. This action falls within the limits of that well known concept in the Argentine Supply Regulations, which states: "*Supply constitutes part of the conduct of war and its influence thereby can be decisive.*" As is well known, the solution consisted of constructing and developing two large artificial "Mulberry" ports. This enabled the invasion to develop without the risk of launching a direct attack against any large port. The reinforcement of the forces and available means—by postponement of operation ANVIL (Invasion of Southern France)—made possible a quick reorganization on land and the early capture of Cherbourg, so badly needed for supply purposes.

The forementioned concept is very well applied here: command recognized the fundamental importance of supply in the situation, and its influence on the invasion plans.

Other Examples

Influenced by supply requirements, the Allies planned to capture the large ports in Brittany after the breakthrough at Avranches. Thus, they could clear the Normandy beaches and make possible the direct arrival of large ships loaded with reinforcements and supplies from the United States.

Nevertheless, the Allied command, in analyzing the situation late in July, foresaw the possibility of delivering a hard blow at the German forces in Normandy by enveloping their southern flank and rear, thus isolating them from the Seine.

But to do that it would be necessary to commit the entire Third Army under General Patton. This meant distracting them from their originally assigned mission. As General Eisenhower said in his official report, ". . . a primary objective has been the capture of the Brittany ports, through which it was intended to introduce the further divisions from the United States necessary to insure the completion of the German defeat. The capture of these ports had been envisaged as a task for the Third Army as a whole. . . ."

Even so, the value assigned to supplies was diminished in the analysis of the situation, and a new decision was adopted in view of the possibility of launching a great battle and annihilating important German forces. At that time logistics was conditioned by more important factors connected with operations. This fact, together with the decisive action of Patton's Army, brought success in the battle of Argentan-Falaise, and prefaced the total liberation of France.

It should be noted in this example that logistics, as an integral part of command, modified the operational requirements, reduced their importance, and contributed to decisive victory.

As stated before, it has been demonstrated that logistics carries a variable value according to the relative importance of other factors involved in the analysis of a situation. Something similar can be deduced from the following example.

When General Eisenhower reached the German frontier, his supply lines were already stretched to the limit. His supply trucks had to travel an average of 300 miles, and tied up great quantities of vehicles, materials and personnel.

The capture of Antwerp by the British made possible the solution of this problem, which threatened to stop the Allied offensive through lack of means to proceed with the offensive.

Up to that time, the heavy cargo vessels which came loaded from the United States and Canada had to stop at Great Britain to transfer their cargo to smaller freighters which could sail into the ports occupied by the Allies. Cherbourg itself could only handle 10,000 tons daily. On the other hand, Antwerp afforded the possibility of unloading 40,000 tons a day.

But the routes of approach to the port of Antwerp were held by the Germans, and to defeat them called for an operation of considerable importance. With the limited means available at that time, this meant paralyzing all other operations of relative importance to concentrate the necessary power in that decisive place.

Undoubtedly there were powerful reasons for such an operation, and they were intimately related to supply. According to several publications, there were many in the Allied command who favored this operation.

The possibility of a rapid campaign in the conquest of the Rhine crossings appeared simultaneously. This would surprise the Germans and allow the Allied forces to reach the plains of northern Germany by way of the Netherlands. These plains were excellent for subsequent operations to flank the Siegfried line and advance on Berlin.

The decision was not easy. In his analysis, the Allied commander was aware of

the need for a new supply base to support further operations against Germany. He knew that his supplies could not be stretched further. He knew that there were three infantry divisions in Cherbourg which were not only short of transportation facilities but had also been compelled to give up their own organic transportation to support and maintain the flow of trucks which transported supplies day and night to the battle front. He was aware that Patton's Army, which operated on the south and protected the flank of the Allied Forces, was short of supplies and faced serious inconveniences in overcoming the German resistance between Thionville, Metz, and Nancy along the Meuse, due to the main axis of the allied operation against Germany being conducted toward the northeast. But the Allied commander also foresaw the possibility of great successes—capture of the Rhine crossings by surprise, utilizing the airborne army of General Brereton, saving many lives and much time and effort. Certainly the operation involved risks, and the dangers of failure were many, but the commander believed that successes involved knowingly and conscientiously running a risk with enough sense of responsibility at the proper time. General Eisenhower ran the risk.

There has been criticism of this decision based on the fact that the advantage sought was not obtained, but the Commander in Chief assumed full responsibility when he stated: "My decision to concentrate our efforts in this attempt to thrust into the heart of Germany before the enemy could consolidate his defenses along the Rhine had resulted in a delay in opening Antwerp and in making the port available as our main supply base. I took the full responsibility for this, and I believe that the possible and actual results warranted the calculated risk involved."

In this last example we see how, in a situation of uncertainty between the influence of supply and an operational possibility, the responsible commander decided to pay most attention to the latter while those in charge of supply cooperated wholeheartedly in an effort to accomplish the mission. In fact, a strict program of supply conservation was effected, all existing supply reserves were utilized to the utmost, and a powerful supply center was established to support the airborne operation which ended with defeat at Arnhem. We can say that "supply assumed the defensive" on the remainder of the front.

Conclusion

It can be clearly seen here how closely related are command and supply and how "supply constitutes part of the conduct of war."

It can also be seen how closely command is identified with supply. This identity requires an understanding and fusion of common interests, which, in combination, forms a harmoniously efficient and capable role.

Not only do tactics and techniques change constantly and rapidly in modern war, but the whole background against which it is fought may alter almost as quickly. To these, often startling, variations on all levels the commander must be able immediately to attune himself and to readjust his plans.

General Sir William Slim, Great Britain